CANADA

DEPARTMENT OF RESOURCES AND DEVELOPMENT

NATIONAL MUSEUM OF CANADA
BULLETIN No. 121

BOTANY OF SOUTHEASTERN YUKON ADJACENT TO THE CANOL ROAD

BY

A. E. Porsild

1951

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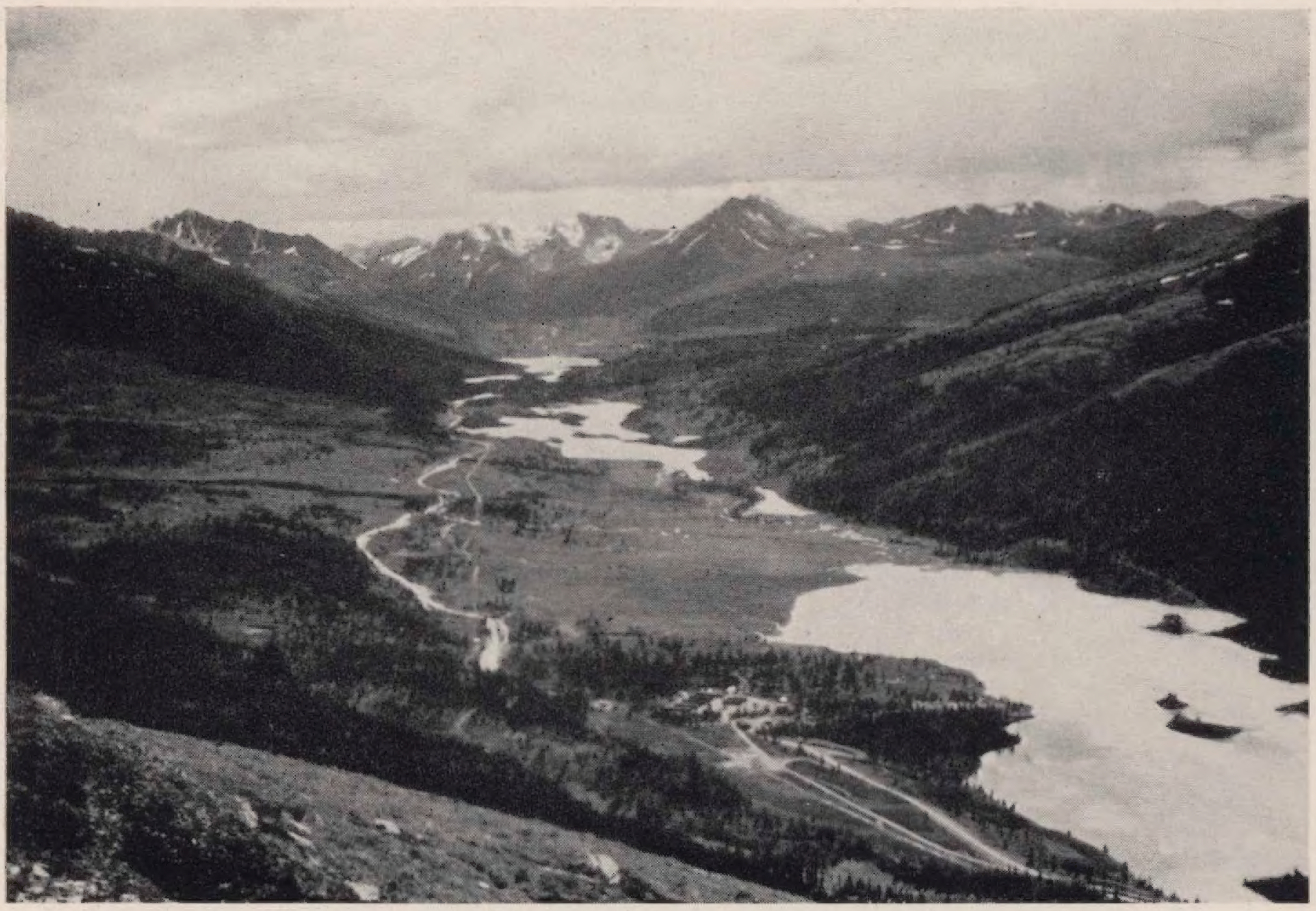
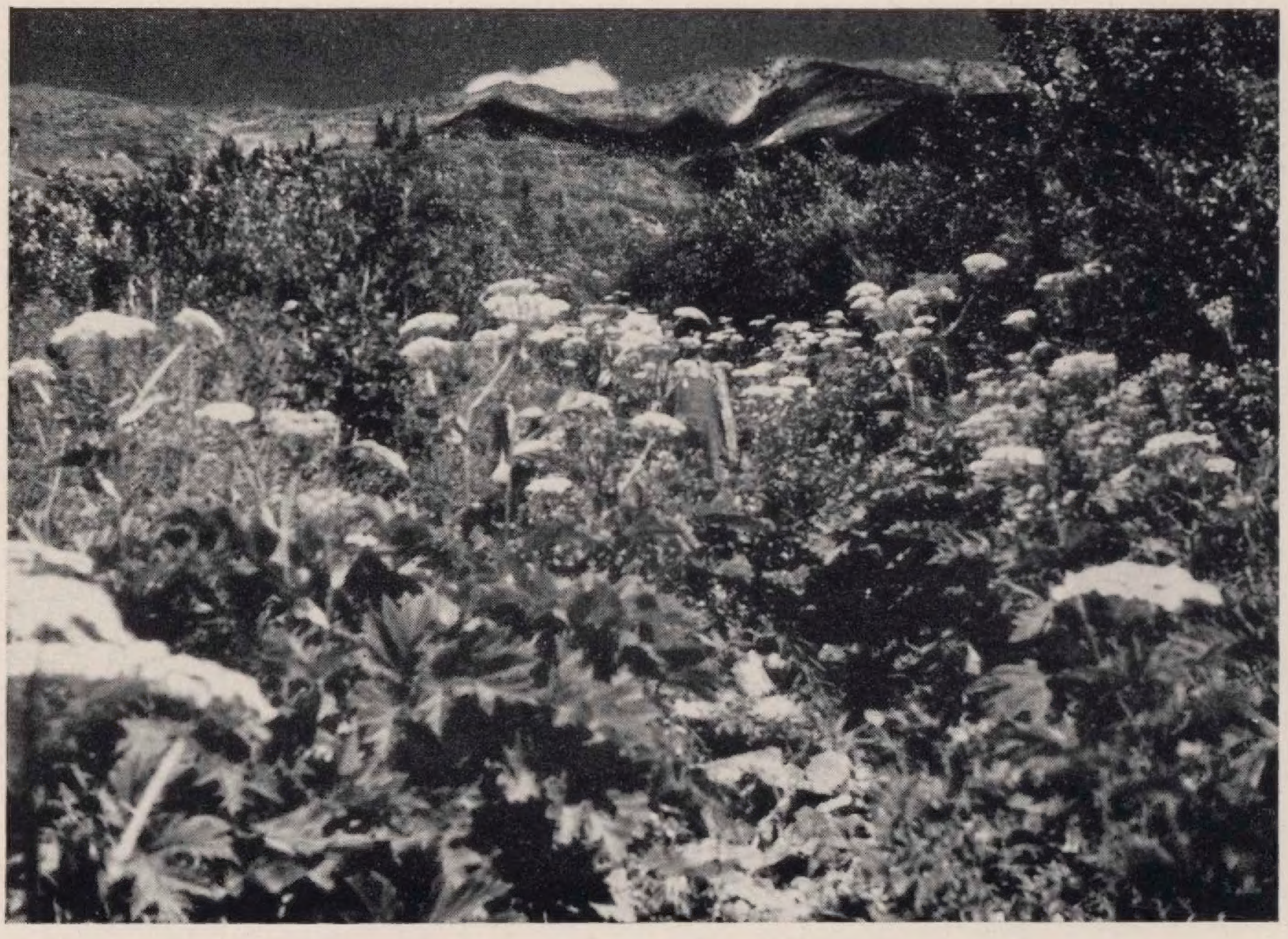


A. Rose-Lapie Pass looking south from 6,000 foot mountain east of Lapie Lake. Canol Road and pipeline follows east side of treeless valley bottom. On high granite mountain in background, west of our upper Rose River camp, snowdrifts still remain on July 22.



B. Rich alpine meadow with *Heracleum lanatum* and *Aquilegia formosa* on steep scree east of upper Rose River camp.

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NATIONAL PARKS BRANCH
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A. E. Porsild

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BOTANY OF SOUTHEASTERN YUKON ADJACENT TO THE CANOL ROAD

INTRODUCTION AND ACKNOWLEDGMENTS

The field work upon which the present report is based was carried out during the summer of 1944 under the auspices of the National Museum of Canada, Ottawa, as part of the North Pacific Planning Project of geological, topographical, and biological exploration of northern British Columbia, Yukon, and Alaska. The report primarily deals with the vascular flora of the Yukon sector of Canol Road in southeastern Yukon, but for the convenience of the reader, all species of vascular plants known to occur in Yukon have been included in the catalogue, p. 61.

The personnel of the field party, in addition to the writer, consisted of Dr. A. L. Rand, Curator of Birds in the National Museum of Canada;[1] Wendell H. Bryenton of Edmonton, Alta., experienced northern trapper, prospector, and traveller, who assisted Dr. Rand; August J. Breitung, formerly of Tisdale, Sask., now with Division of Botany, Central Experimental Farm, Ottawa, who was my assistant; and Albert Stoltz, cook.

An account of the bird and mammal life of the Canol Road has been given by A. L. Rand in "Mammal Investigations on the Canol Road, Yukon, and Northwest Territories" (Rand, 1945), and in "List of Yukon Birds and those of the Canol Road" (Rand, 1946). The writer (Porsild, 1945) has published an account of "The Alpine Flora of the East Slope of the Mackenzie Mountains, Northwest Territories."

It is a pleasure here to acknowledge the generous assistance given to the National Museum party in the field by officers of the United States Army Corps of Engineers, Chief Operations Division at Whitehorse, in charge of construction of the Canol Road and Pipeline, and to construction engineers and road crews of the Elliott Construction Company, subcontractors under the firms: W. A. Bechtel Company, San Francisco, H. C. Price Company, Bartlesville, Oklahoma, and W. E. Callahan Construction Company of Dallas, Texas.

In Whitehorse, C. K. LeCapelain, Liaison Officer, and Lawrence Higgins, Mining Recorder, both of the Department of Mines and Resources, in a great many ways facilitated the work of the party. The writer particularly wishes to acknowledge the genuine interest taken in the botanical work and the valuable help given by all members of the field party, especially by his indefatigable and enthusiastic assistant, August Breitung.

A number of specialists have been kind enough to examine critically specimens in the collection. Dr. Bassett Maguire thus verified the determination of our large collection of *Arnica*, Dr. Hugh M. Raup studied certain collections of *Salix*, Dr. Lyman Benson examined our material of *Ranunculus occidentalis* var. *brevistylis*, and Mrs. Agnes Chase very kindly verified my determination of several collections of *Poa*. Finally, my father, Dr. Morten P. Porsild, during his visit to Ottawa in 1947, critically read parts of the manuscript.

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[1] Now Curator of Ornithology, Chicago Natural History Museum.

The party assembled at Edmonton, Alta., on May 26 and on May 29 travelled north by truck and bus over the Peace River Road and the Alaska Highway to Whitehorse, Yukon, where it arrived on June 4. Actual field work commenced on June 8 along the Canol Road, which starts at Mile 0 at Johnson Crossing near the north end of Teslin Lake and extends in a northeasterly direction for 513 miles to Norman Wells on the Mackenzie River (*See* Figure 1). During the following 3 months, main camps were established, approximately 50 miles apart, between Mile 0 and the Mackenzie-Yukon Divide at Mile 285. Each main camp was occupied from one to three weeks. From these main camps excursions were made by truck or on foot to points of particular interest east or west of the road. Owing to the impassibility of the road between Mile 250 and 270 until after the beginning of September when winter had already started, we had to abandon plans for continuing the survey east of Macmillan Pass. From September 5 to 10, a hurried reconnaissance trip was made from our last camp west of the Mackenzie-Yukon Divide across the eastern part of Canol Road to Norman Wells. We started back from Norman Wells on September 7 over the same route. The party arrived in Edmonton on September 22 and in Ottawa on September 26.

The season had been a profitable one favoured by good weather and good working conditions for the botanists as well as for the zoologists.

The botanical collections totalled 3,041 numbers of plants aggregating about 18,000 herbarium specimens, together with several hundred photographs of plants, mostly in colour, and a great mass of botanical notes on taxonomy, distribution, and ecology.

The country traversed by the Canol pipeline and its service road, known as the Canol Road (now both abandoned), between Norman Wells on Mackenzie River and Teslin Lake on the Alaska Highway has long remained among the least known parts of Canada. This is particularly true of the Mackenzie Mountains, which form the watershed between the Mackenzie and the Yukon drainages, but it applies almost equally well to the more easily accessible Pelly Mountains in southeastern Yukon. In the years following the discovery of gold in Yukon, some of the rivers that rise on the Mackenzie-Yukon watershed were explored by prospectors, but the economic returns were so meagre that in the succeeding years the country was largely left to Indian trappers and to a few big-game hunters.

A few geologists have visited the region, and from their exploratory work the geology was known in a general way. To botanists, however, and particularly to plant geographers, this southeastern part of Yukon, as well as the northern part of the territory and large parts of Alaska, has remained among the least known parts of North America.

A few trained botanists have travelled down Yukon River to Dawson and beyond, but apart from their collections the botanical knowledge of the rest of Yukon has been based almost entirely upon chance collections made by geologists, surveyors, or tourists, to whom the collecting of plants has been purely incidental. Prior to the present survey the most important

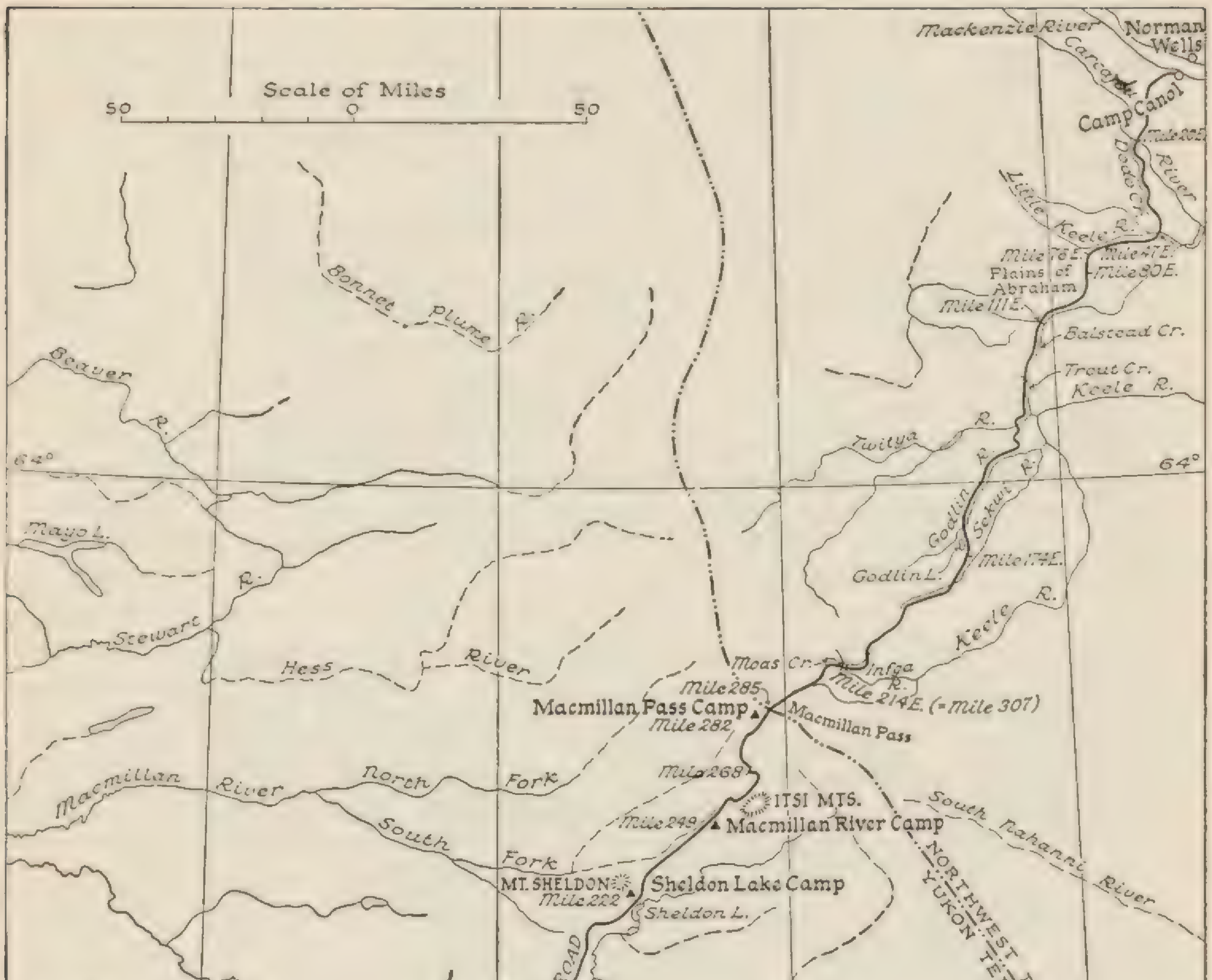

Figure 1. Map of Canol Road, Yukon and Northwest Territories, with mileages and camps established by the National Museum field party, 1944.

recent contribution to the botanical knowledge of the general region was made by Dr. Hugh M. Raup of the Arnold Arboretum, Harvard University, who in 1941 led an expedition to Brintnell or Glacier Lake on upper South Nahanni River in Mackenzie Mountains (Raup, 1947). Except for his large collection nothing was known of the botany of Mackenzie Mountains.

HISTORY OF EXPLORATION

The Pelly River was first explored by Robert Campbell, an intrepid employee of Hudson's Bay Company, who in 1840 ascended the Liard from Fort Halkett and traced Finlayson River to its source in Finlayson Lake. Thence he crossed the 3,150-foot-high divide into the Yukon drainage and descended Pelly River, which he named in honour of Sir John Henry Pelly, a Governor of the Company. In 1842, a trading-post, Pelly Banks, was established on the upper Pelly, and in the following year Campbell descended the Pelly to its junction with a river from the south, which he named the Lewes after Chief Factor J. L. Lewes. The Lapie and Ross Rivers, tributaries to the Pelly, also were discovered and named by Campbell. Later he descended the main Yukon River as far as the Porcupine, thereby proving that the Pelly and Lewes were both part of the great Yukon drainage. Campbell eventually ascended the Porcupine, crossing over to the Mackenzie, and reached Simpson before freeze-up. The routes discovered by Campbell from the Mackenzie to the Yukon were difficult and dangerous, and trading was abandoned in 1853 following the pillaging and destruction by Chilcat Indians of the first Fort Selkirk, which had been established near the junction of the Pelly and the Lewes.

In 1887 Geo. M. Dawson of the Geological Survey of Canada followed Campbell's route and in his report (Dawson, 1889) has given an excellent account of the country traversed by Finlayson and Pelly Rivers. The report contains a number of notes on the vegetation along the route.

In 1893 Warburton Pike crossed from Liard River by way of Frances Lake to Pelly Lakes near the head of Pelly River, descending the Pelly and the Yukon to the sea.

In 1902 R. G. McConnell and Joseph Keele of the Geological Survey of Canada explored Macmillan River (McConnell, 1903).

In 1905 Charles Sheldon, a big-game hunter, spent part of a season in southeastern Yukon and in his book (Sheldon, 1911) gives a very good account of the country and of the wildlife.

In 1907-8 Joseph Keele explored Pelly River for a distance of about 30 miles above Pelly Lakes and later ascended Ross River to its source in Christie Pass whence he descended the Gravel (now called Keele River) to its junction with the Mackenzie. In his report Keele (1910) gives an excellent account of the geology and topography of that great system of mountains which he named Mackenzie Mountains.

In 1935 E. C. Lees (1936), of the Geological Survey of Canada, mapped the Teslin-Quiet Lake area, and the same year J. R. Johnston (1936), also of the Geological Survey, mapped an area along Pelly River between Macmillan River and Hoole Canyon.

The Canol pipeline from the oil wells on the Mackenzie to the refinery at Whitehorse, Yukon, was constructed during the war as an emergency measure to supply an easily defensible route for oil into Alaska. The decision to construct the Canol Project was reached in April 1942, and in April 1944, oil began to flow through the main line to Whitehorse, 513 miles from the wells. Simultaneously with the pipeline, a fully graded service road was constructed from the west bank of the Mackenzie opposite Norman Wells connecting Alaska Highway at Johnson Crossing on Teslin Lake. This road was officially opened for through-traffic in September 1944, only to be abandoned at the end of the war. For the history and background of the Canol Road and pipeline see Lloyd, 1944, and Finnie, 1945.

TOPOGRAPHY OF YUKON SECTOR OF CANOL ROAD

E. D. Kindle of the Geological Survey of Canada in 1944, and again in 1945, made geological reconnaissances along Canol Road from Teslin Lake to Macmillan Pass. In his report and map Kindle (1946) gives an excellent description of the country traversed by the road and its geology. The following general description of the topography and glaciology is quoted from Kindle.

"The southern half of the Canol Road runs in a southwesterly direction across the Yukon plateau. Northeast from about mile 260 the road enters the Mackenzie Mountains and follows a winding course across seven mountain divides before descending to Mackenzie River Valley. Macmillan Pass, at mile 283, marks the divide between streams flowing into Mackenzie River and those draining into the Yukon. The Yukon plateau, as seen along the road, is an extensive stretch of elevated land, broken by large groups of mountains that generally rise from 3,000 to 4,000 feet above the valleys. A belt of particularly rugged mountains lying between Pelly River and Quiet Lake is named Pelly Mountains. Several peaks near the road in this range stand more than 7,000 feet above sea-level.

"At Teslin River (mile 0) the elevation is 2,250 feet. To the northeast the road rises gradually, and at 11 miles passes over a divide at elevation 4,040 feet to enter the wide valley of Nisutlin River. Mountain peaks a few miles northwest and southeast of this pass rise to elevations exceeding 6,000 feet. Bedrock in Nisutlin River Valley is almost everywhere mantled by a thick cover of boulder clay, so that no rocks are exposed along the road until Quiet Lake is reached. This lake forms the headwaters of Big Salmon River, which flows northwesterly to the Yukon. It is a deep, clear-water lake, 18 miles long and at most places from 1 to 2 miles wide. The road follows along the water's edge for several miles at the northeast end of the lake. The country between the south end of Quiet Lake and Nisutlin River is comparatively low, but northeast of the lake the road crosses a 3,200-foot divide at mile 65·5, then descends a 2-mile grade to Rose River Valley. The bridge over Rose River is about 2,500 feet above sea-level. Bedrock on the mountain top (elevation, 4,600 feet) on the east side of Quiet Lake is rounded and polished by glacial ice, and rounded granite boulders lie upon greenstone and schists. The slopes are mantled with boulder clay, and the pass at mile 65·5 is underlain by a thick mass of glacial till. Four mountain peaks on the west side of Quiet Lake range from 6,066 to 6,642 feet high. These mountains show a rounded, glaciated aspect below an elevation of 5,000 feet.

"The road follows Rose River Valley from mile 68 to mile 103, the latter being on the divide at elevation 3,600 feet between Rose Lake, at the head of Rose River, and Lapie Lakes, at the head of Lapie River, which drains northerly to Pelly River. Rose River Valley is floored with a thick deposit of glacial till, but in many places the river has cut into and reworked the till to form extensive beds of sand and gravel. Some of these gravel beds outcrop along the road near mile 70, and also at mile 88 where a large tributary stream joins Rose River from the west. Abandoned glacial cirques that bottom in U-shaped valleys at an elevation of 4,800 feet were seen on the north side of 6,000-foot peaks, 3 miles west and southwest of mile 82. These and a high, strongly glaciated, U-shaped valley that drains north and west to Rose River from 4 miles east of mile 78 are evidence of ice accumulation there during the glacial period. Other cirques, also free of ice, were noted on the northwest sides of high granite peaks west from miles 95 to 98. The entire granite belt between miles 83 and 100 is characterized by the presence of very high, knife-edge mountain ridges.

"The valley occupied by Lapie River is narrow and U-shaped, with mountains close to the road. The valley sides are covered by a thick mantle of boulder clay to elevations of about 4,000 feet, and the river has cut deeply into these deposits, particularly on the northwest side, leaving very steep valley walls. Alpine glaciers were active at one time on the north slope of the mountain west of mile 115, but the mountain peaks nearer the Pelly, between miles 117 and 130, are in a drier belt and appear to have escaped glaciation. Lapie Lakes and Rose Lake are giant kettle-holes that were occupied by large masses of stagnant ice during the late stages of valley glaciation. These lakes are roughly 3,500 feet above sea-level. An esker that formed along the west side of Rose Lake and upper Lapie Lake rises to 125 feet above the water. Sand, gravel, and boulder terraces several hundred feet wide occur in a number of places along the valley sides near Rose Lake and Lapie Lakes, and rise about 250 feet above the level of the lakes. They are believed to have been formed by running water when the valley was filled to an equal or higher level with melting ice and glacial debris, with melting most pronounced along the flanks of the disintegrating ice mass. A few other terraces, noted farther down the valley as far as mile 121, are located at the mouths of tributary streams and represent an accumulation due to damming by ice or till deposits in the main valley.

"Throughout most of its length Pelly River occupies a trench-like depression that trends north 55 degrees west for several hundred miles. This valley trench [Tintina Valley] was first recognized by McConnell (1903, p. 24) who states that the valley is occupied in different parts of its course by a part of the Pelly, a branch of Kalzas River, Crooked Creek, a part of Stewart River, Clear Creek, Flat Creek, and the lower part of the North Fork of Klondike River. The valley is 8 miles wide where traversed by the Canol Road. Mile 132, at Lapie River bridge (elevation, 2,500 feet), is near the southwest wall of the trench, and mile 141, at Pelly River (elevation, 2,200 feet), is near the northeast side of the trench. A short distance west of mile 132, Pelly Mountains rise precipitously to elevations exceeding 5,000 feet, and elsewhere along this continuous mountain front the peaks rise to over 5,500 feet. On the northeast side of the trench the mountains also rise sharply, but in the vicinity of Ross River are comparatively low, with rounded tops somewhat below timberline. The trench is apparently the result of profound faulting and prolonged differential erosion. One of the northwesterly trending faults seen on the mountain at elevation 4,500 feet, north of mile 132, is marked by quartz-biotite schists in contact with black shales and sandstone beds of Palæozoic age. The schistose rocks of the trench are on the uplifted side of the fault belt, but have undergone greatest erosion due to their softer character. The greater part of the trench was eroded by Pelly River during Cretaceous time, and Paleocene sediments were deposited later at a number of places in the valley bottom.

"During the glacial period the trench was filled by ice that moved northwesterly down grade. The low mountains to the northeast were ice-covered at that time, as proved by the occurrence of glacial striæ crossing the top of the ridges north of mile 146. Striæ and deep grooves seen there at an elevation of 3,500 feet strike north 50 degrees west. Glacial ice brought much debris into the trench and filled the lower hollows and ravines in the low mountainous sectors to the northeast, whereas the tops of these mountain ridges were rounded and scraped bare of most of their soil. Terraces of gravel that occur at various places along the sides of Pelly Valley probably formed in streams flowing along the border of the melting glacial ice during stages in its recession, and ponding of some of the streams resulted in deposition of silt beds in many places along the valley walls.

"The country adjoining the road between Pelly River (mile 141) and Sheldon Lake (mile 220) is much like some rugged areas of the Canadian Shield, with rock-ribbed, glaciated hills rising from a few hundred to 1,000 feet above a valley bottom that is heavily mantled with glacial deposits. The road rises gradually for 25 miles and crosses the Anvil Mountains' granite batholith, mileage 161 to 171, at an average elevation of about 3,300 feet. The road circles the south side of Orchay Lake at the head of Orchay River, which empties into Pelly River 20 miles below the mouth of Ross River. Orchay Lake is about 3,200 feet above sea-level. At mile 171 the granite contact with the sedimentary rocks is marked by a steep grade that descends 400 feet to the soil-covered floor of Ross River Valley. Much of the valley bottom along the road between miles 171 and 200 is low and swampy with considerable areas of muskeg. Forest growth is poor over such areas except along the streams where drainage has been good. Along the stream half a mile north of mile 175 there are birch trees 12 inches in diameter and spruce up to 14 inches in diameter that range from 75 to 100 feet in height (elevation, 2,850 feet). One mile farther north, at elevation 3,650 feet, spruce were seen that measure 14 inches in diameter 6 feet above the ground, and were as much as 75 feet tall.

"From mile 202 to 205 the road follows a northerly course along the top of a broad esker that stands as much as 100 feet above the underlying drift. The esker swings west into Dragon Lake at mile 205, and as the lake drains westerly by way of Riddell River to the South Branch of Macmillan River, it is thought that the glacial stream that formed the esker beneath the melting ice field also drained that way. Dragon Lake is a deep, spring-fed, clear-water lake, formed of a network of kettle-holes nestled among small eskers and bounded by sand and gravel deposits. Sheldon and Lewis Lakes are in great contrast, as their water is milky and they occupy shallow depressions in a wide valley carpeted by thick deposits of boulder clay. The barometer reading was 2,900 feet at Dragon Lake and 3,000 feet at Sheldon Lake.

"Sheldon Mountain is the first big mountain near the road on the route northeast from Pelly River. A granite core and baked sedimentary rocks have given the mountain extra hardness to withstand erosion, so that under prolonged differential erosion it now towers over 4,000 feet above the lake. Mount Riddell, some 6 miles farther west, is only a few hundred feet lower. Two cirques seen on the north side of Sheldon Mountain are now free of ice. On the north and northeastern slope of Sheldon Mountain perched boulders of large size were observed to elevations of 4,600 feet, and glacial striæ seen below this elevation and at many places in the valley below have a common strike of about 10 degrees north of west.

"Ten miles northeast of Sheldon Mountain, at mile 229·5, the road crosses the glaciated divide (elevation, 3,950 feet) between Ross River Valley and the valley of the South Branch of Macmillan River. The road follows close to the south side of the latter river from mileage 232 to 252, then crosses and follows the north side to mile 268. Low mountains outcrop southeast of the road between miles 228 and 250, but they rise scarcely to timber-line, whereas many of the mountains on the north side of the Macmillan in this area appear to exceed elevations of 5,000 feet.

"An unusually high and rugged group of mountains that rise a few miles southeast of the road, between mileages 250 and 265, are named Itsi Mountains. They owe their greater resistance to weathering to the granite stocks that form their cores. The highest peak of Itsi Mountains is judged to be more than 7,500 feet above sea-level. Large masses of glacial ice occur in cirques along the north sides of these mountains. A broad, rolling valley strewn with large boulders and deposits of boulder clay extends north 4 to 6 miles from Itsi Mountains to Macmillan River and runs an additional 5 or 6 miles north of the river between mileage 251 and 261. This was evidently a great gathering ground for ice during the Pleistocene epoch, and the ice moved down the valley of the South Branch of Macmillan River. Glacial striæ on the rounded mountain top at elevation 4,600 feet, north of mile 251, trend south 25 degrees west. A thickness of more than 100 feet of boulder clay is exposed along the river at the bridge at mile 252. Much of the valley floor is between 3,300 and 3,600 feet above sea-level, and due to the prevalence of permanent frost in this latitude the forest growth is poor. The spruce are generally less than 50 feet high and 6 inches in diameter.

"From mile 265 to 283 (Macmillan Pass) the road is confined to a narrow, steep-walled valley with mountain peaks on both sides reaching from about 5,000 to 6,000 feet above sea-level. Three of the higher mountains seen close by or within a few miles of the road, towards the southeast, are comprised largely of granite. The barometer showed an elevation of 3,600 feet at mile 268, and 4,500 feet at Macmillan Pass. Northeast of the pass the road runs for 10 miles along the south side of Tsichu River through high open country with mountains lying back a mile or more to the north and south. The road crosses Tsichu River at mile 292, then climbs slowly for a number of miles in crossing a high, barren plateau that lies between Tsichu and Intga Rivers. According to the barometer the road rises to an elevation of 5,700 feet in passing over this plateau."

PHYSIOGRAPHY

CLIMATE AND METEOROLOGY

No meteorological data are available for any part of the Canol Road. The nearest Yukon weather stations are at Whitehorse, Carcross, Dawson, Mayo, and Watson Lake, and in the Northwest Territories at Good Hope, Norman, and Simpson.

These stations are all located at a somewhat lower elevation than are most points along the Canol Road and for this reason a direct comparison or interpolation of meteorological data is not possible.

The following tables, giving temperatures in degrees Fahrenheit and precipitation in inches, are from Climatic Summaries, Department of Transport, Meteorological Division, Toronto, 1948.

Monthly and Annual Averages of Daily Mean Temperature

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Carcross	31	−2	4	16	30	42	51	55	52	45	34	18	6	29
Dawson	41	−21	−12	4	29	46	57	60	55	42	26	1	−14	23
Mayo	17	−13	−4	12	31	46	56	58	54	43	29	5	−9	26
Watson Lake	9	−4	3	16	33	46	55	58	55	46	34	7	−4	29
NORTHWEST TERRITORIES														
Fort Good Hope	31	−24	−19	−10	14	38	54	59	56	40	21	−6	−20	17
Fort Norman	31	−19	−13	−2	19	41	55	59	54	42	25	−1	−15	20
Fort Simpson	42	−18	−11	1	26	45	56	62	57	46	29	4	−12	24

Monthly and Annual Averages of Extreme Lowest Temperature

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Carcross	29	−39	−36	−21	0	19	28	33	29	21	7	−14	−30	−44
Dawson	44	−52	−45	−34	−9	21	32	36	30	18	−1	−30	−43	−55
Mayo	17	−53	−45	−34	−7	21	32	34	27	16	−4	−32	−49	−59
Watson Lake	9	−44	−42	−29	−5	22	34	37	30	23	7	−29	−37	−56
NORTHWEST TERRITORIES														
Fort Good Hope	13	−54	−51	−44	−28	8	31	35	27	15	−13	−41	−52	−58
Fort Simpson	17	−49	−44	−34	−14	22	33	39	32	24	2	−24	−41	−53

Monthly and Annual Averages of Extreme Highest Temperature

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Carcross	29	37	41	43	52	68	77	79	73	69	55	45	39	81
Dawson	44	15	24	40	57	74	83	84	80	68	52	33	21	86
Mayo	17	34	34	45	58	71	80	83	79	69	54	38	30	85
Watson Lake	9	34	38	46	55	74	79	81	81	72	59	37	26	84
NORTHWEST TERRITORIES														
Fort Good Hope	13	11	22	32	52	72	85	84	80	69	47	27	20	87
Fort Simpson	17	23	28	40	61	76	83	86	84	74	63	36	22	88

Average Monthly and Annual Precipitation in Inches

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Carcross	31	0·61	0·91	0·47	0·22	0·43	0·83	1·04	0·85	1·07	0·94	0·92	0·67	8·96
Dawson	41	0·87	0·70	0·52	0·51	1·01	1·18	1·53	1·55	1·41	1·17	1·13	1·03	12·61
Mayo	17	0·63	0·42	0·42	0·24	0·94	1·38	1·61	1·90	1·19	0·91	0·81	0·78	11·23
Watson Lake	9	1·11	0·70	0·64	0·62	1·18	2·36	1·94	1·55	1·42	1·34	1·67	1·32	15·85
NORTHWEST TERRITORIES														
Fort Good Hope	31	0·53	0·50	0·49	0·49	0·69	0·98	1·55	1·71	1·19	1·09	0·82	0·59	10·63
Fort Norman	31	0·46	0·49	0·42	0·43	1·15	1·34	2·02	1·94	1·06	0·85	0·61	0·45	11·22
Fort Simpson	42	0·72	0·70	0·48	0·70	1·37	1·46	1·99	1·47	1·31	1·07	0·85	0·84	12·96

Average Monthly and Annual Snowfall in Inches

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Carcross	31	6·1	8·9	4·6	1·9	0·3	–	–	0·1	0·8	4·4	8·1	6·6	41·8
Dawson	41	8·7	7·0	5·1	3·5	0·6	0·1	–	T	1·8	7·9	11·3	10·2	56·2
Mayo	17	6·3	4·2	4·1	1·1	–	–	–	–	0·8	6·1	7·8	7·7	38·1
Watson Lake	9	11·1	7·0	6·3	4·0	0·8	–	–	–	0·3	9·2	15·5	13·2	67·4
NORTHWEST TERRITORIES														
Fort Good Hope	31	5·3	4·9	4·9	4·8	3·8	0·4	–	0·2	2·8	8·9	8·2	5·8	50·6
Fort Norman	31	4·6	4·9	3·5	4·1	2·5	0·2	–	0·1	2·8	7·0	6·1	4·5	40·3
Fort Simpson	42	7·2	7·0	4·8	5·8	4·1	T	–	0·1	0·7	8·1	8·5	8·3	54·6

Average Monthly and Annual Number of Days with Measurable Rain[1]

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Dawson	10	0	0	*	2	9	11	13	14	10	4	0	0	63
Mayo	10	0	*	*	2	9	10	12	15	10	4	*	*	62
Watson Lake	8	0	0	*	3	9	12	12	14	12	6	2	*	70
Whitehorse	5	0	0	*	2	5	9	13	11	10	6	*	1	57
NORTHWEST TERRITORIES														
Fort Good Hope	10	0	0	0	1	5	6	9	14	8	3	*	0	46
Fort Norman	10	0	0	0	*	6	8	10	12	8	3	0	0	47
Fort Simpson	10	0	0	0	2	7	7	10	9	6	3	0	*	44

Average Monthly and Annual Number of Days with Measurable Snow[1]

Station	Yrs. obs.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
YUKON														
Dawson	10	8	6	8	2	*	–	–	–	1	7	11	10	53
Mayo	10	6	5	4	3	–	–	–	–	1	6	7	7	39
Watson Lake	8	9	7	5	4	*	–	–	–	1	8	13	13	60
Whitehorse	5	7	7	8	2	1	–	–	–	1	5	11	8	50
NORTHWEST TERRITORIES														
Fort Good Hope	10	7	7	8	6	4	*	–	–	2	9	11	7	61
Fort Norman	10	6	7	7	6	2	–	–	–	1	6	8	6	49
Fort Simpson	10	6	5	8	3	1	–	–	–	*	5	8	8	44

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[1] The * indicates a total of less than 5 days with measurable rain or snow during a 10-year period.

Location of Meteorological Stations

—	Lat. N.	Long. W.	Elevation above M.S.L.
	° ′	° ′	Feet
Dawson	64 04	139 29	1,062
Carcross	60 21	134 44	2,171
Mayo	63 35	135 50	1,625
Watson Lake	60 07	128 48	2,248
Fort Good Hope	66 15	128 40	251
Fort Norman	64 55	125 35	300
Fort Simpson	61 52	121 13	572

A good general account of the climate and the progress of the seasons in southeastern Yukon has been given by Keele (1910).

"The region lying between the Yukon and Mackenzie rivers possesses, as a whole, an extremely variable climate within the year, while the topographic provinces included within this area exhibit certain climatic differences; the peculiarities being chiefly as regards precipitation.

"The Yukon plateau, protected from the prevailing westerly winds by mountain ranges from 5,000 to 10,000 feet in height, has an arid climate, very little wind, and temperature ranging from 80° in June to $-60°$ in January.

"The Western slopes of the Mackenzie mountains, of higher elevation and exposed to the prevailing winds, have a comparatively high precipitation, and periods of high winds, while the eastern slopes being on the leeside receive a small precipitation, and immunity from the high winds. The average monthly temperature, however, does not vary much over the three provinces.

"June is a perfect summer month with practically no darkness, and on fair days nearly twenty hours of bright sunshine; the temperature sometimes reaches as high as 90°.

"January is the coldest month of the year, with about five hours' sunshine on unclouded days; the temperature seldom rises above zero, and for several days is down to 60°, or lower.

"Three months of the year, from May 25 until August 25, are practically free from frost in the valley bottoms.

"July, August, and September are the months of greatest rainfall, which is scanty over the Yukon plateau, being only about 7·5 inches in the year. There are no recorded measurements in the mountains to the eastward, but it is probably not less than thirty inches annually.

"The greatest amount of snow falls during the late autumn and early winter. In March 1908, the snow was five feet deep in the valley of the Ross river near the divide, but on the Pelly river it would not be more than half that depth at the same time.

"On the east side of the divide the snowfall is light, being three feet less than on the west side in 1908.

"On and after September 1, fresh snow begins to appear on the mountains, while rain is falling in the valleys. The first few falls of snow generally disappear from the valleys, but remain on the mountains, consequently there is a much greater accumulation of snow there.

"The small watercourses begin to freeze about the middle of September; the ice begins to form on the larger streams early in October, and they are generally closed by the end of that month.

"The water becomes very low in winter, the streams being fed altogether from underground sources, and very little erosion of any kind goes on then, as no rock fragments or debris of any kind were seen on the snow slopes on the mountains.

"In the lengthening days of May the snow begins to disappear in the valleys, principally by insolation and evaporation, and by the first of June very little remains except on the mountains.

"The rivers open between May 10 and 20, and flood-water comes down early in June, after which a period of high water continues until about the middle of July, or later if the season is a rainy one."

From Keele's notes from 1908, as well as from phenological data obtained by us, it would appear that the season of 1944 was a fairly normal one on Canol Road. At Whitehorse (elevation 2,130 feet) the season was far advanced at the time of our arrival in early June and by the end of July nearly all phanerogams had matured seeds. Not until the second week of June were the earliest spring flowers out in the Teslin-Nisutlin River Pass (4,040 feet) and in Rose-Lapie Pass (3,750 feet), whereas at Lapie Crossing (2,750 feet) and in the Pelly Valley (2,500 feet) the season was then as far advanced as at Whitehorse. In the vicinity of Mount Sheldon on the upper Ross River, autumn commenced about the middle of August, when nearly all species had gone to seed and the leaves had begun to turn.

Considerable rain fell in Pelly Mountains during the early part of June when dry and warm weather was the general rule at Whitehorse and Pelly River. From the middle of June through July and August the weather was generally good, most days starting with clear skies changing to a moderate overcast with occasional showers of short duration during afternoons and evenings. Light breezes and moderate temperatures were the rule on most days throughout this period, and only on one or two days did the weather get uncomfortably hot. No snow or killing frosts were experienced during June, July, and the first two weeks of August. On upper Rose River (3,500 feet) in mid-July, two nights of clear skies were accompanied by temperature down to 28° F. when masses of flowering *Epilobium latifolium* on a gravel bar were frozen stiff and covered with ice crystals, which, however, did no damage even to the floral parts. On those nights members of our party who were camped in the valley above, at 4,000 feet elevation, reported no frost.

On most clear nights a moderately heavy dew was noted. Judging from the amount of snow that remained on Pelly Mountains on June 8, the winter snowfall is considerable. Although on that date there was little or no snow at road-level or on south- and west-facing slopes, those facing north and east, as well as mountain valleys and plateaux, were deeply buried in snow down to treeline. Active glaciers were not seen along Canol Road except in the isolated Itsi Mountains, but in a number of north-facing cirques considerable masses of snow persisted through the season of 1944.

NIVATION AND WEATHERING

Nivation is active on north and east slopes of most of the higher mountains. In a large cirque west of Mile 95, on upper Rose River, a mass of snow, which on July 18 was at least 20 feet thick, consisted largely of avalanche snow mixed with small and large rocks brought down from the upper rim of the cirque where huge snow cornices remained until the end of July (elevation 6,100 feet). The cirque is approximately 2 miles long and from one quarter to one-third mile wide; near the outlet, the floor stands at about 4,770 feet. From July 8 to 15 snow melted rapidly. On July 8 the stream issuing from the cirque could be crossed on foot only with difficulty and on July 15 had barely diminished in volume. Less than a mile below the cirque the water in the stream measured 38° F. at 8.00 a.m. and 41° F. at 6.00 p.m. with no appreciable decrease in volume at midnight when the temperature of the water had decreased to 36° F. The surface of the snowfield was then frozen. Footprints made here at 10.00 a.m. had completely vanished before night, although the day had been dull and not very warm. Below the cirque, on a steep north-facing scree, a snowbank, which on July 8 was 2 feet deep, had completely vanished on July 15.

The floor of a south-facing cirque on the upper south fork of Macmillan River, opposite Mile 282, was at 6,450 feet elevation. On September 28 some large residual snowbanks remained at the head of the cirque, which evidently had contained a small glacier not so very long ago. Huge rock screes, all fresh and without moss or lichen growth, covered the base of the rims, whereas the floor was paved with angular moss-covered rocks amongst which grew *Eriophorum angustifolium*, *Carex pyrenaicum* (sterile), *Luzula arcuata*, *L. Wahlenbergii*, *Oxyria digyna*, and *Cassiope tetragona*. Strewn over the floor of the cirque were fresh rocks brought down by avalanches.

Weathering is rapid at high elevations, as shown by the fresh talus slopes and rock slides that cover the base of all steep north- and east-facing mountains. A striking evidence of the rapid weathering was noted on the summit of a mountain west of upper Rose River (elevation 6,780 feet) where a cairn built of large granite blocks had almost completely crumbled due to weathering. The cairn contained no record and, so far, has not been dated.

Avalanche paths were noted on most of the higher mountains. One of the best examples was on a mountain west of Mile 268 on the south branch of Macmillan River where, in the spring, avalanches had descended from a hanging valley across 1½ miles of gentle slope to the river. Along its path, trees were broken and uprooted, and a considerable load of rocks had been deposited.

Fossil stone stripes and stone creeps are very abundant in Pelly Mountains, as are concentric ridges caused by soil flow on mountain slopes. Recent examples of these phenomena were small and uncommon, except in the valleys of the Ross and the south branch of the Macmillan where permafrost had been uncovered by road construction. Some striking instances were noted where the road and pipeline traversed slopes covered by black spruce muskeg. When the protective surface was removed by the road builders, erosion and solifluction began almost at once, causing considerable slipping so that the road and pipeline when viewed from a distance appeared wavy and festooning. Once disturbed, ballasting did no good and only when the road-builder learned to build the road directly on top of the undisturbed muskeg was this difficulty overcome.

PERMAFROST

The numerous fresh road-cuts, gravel and sand pits, as well as excavations for foundations along Canol Road, afforded an excellent opportunity for soil examination. These disclosed that, at road level, permafrost is almost entirely limited to the level or poorly drained areas of glacial boulder clay, so prevalent in the valleys of the Ross and the south branch of Macmillan River.

In Pelly Mountains permafrost is perhaps the rule on steep and moist, tree-covered, mossy north and east slopes, whereas no permafrost was detected on the dry and warmer south and west slopes. Even favourably exposed and well-drained gentle slopes of elevations between 5,000 and 6,000 feet, where we found such rich assemblages of plants, did not contain permafrost.

SOILS

Most of the surface soils exposed at road level along Canol Road are derived from glacial erosion and deposition during Pleistocene glaciation or during the retreat of the glaciers by glacial streams or by lakes impounded by glaciers. In the valley bottoms where the road follows present or former drainage systems, the surface soils are washed gravels or sand; at higher levels up to the upper limits of glaciation are found unsorted glacial tills. On lower Lapie River were noted remnants of strongly compacted and cemented tills undoubtedly antedating the last glaciation. Those older tills once filled the canyon of the Lapie and have been cut through to form the present stream-bed.

A deposit of white volcanic ash 5 to 10 cm. thick is found close to the surface along the valley bottoms and at low elevations throughout the area transected by Canol Road but was not seen on the mountain slopes or plateaux (Plate II A). Similar ash deposits have been recorded from other parts of Yukon and from Alaska and, by Capps (1931), are estimated to be approximately 1,400 years old. Kindle (1946) believes that the ash has been washed down from the mountain slopes by wind and rain.

Recent sedimentation following the deposition of volcanic ash appear to be slight and local, because erosion has long been limited to stream heads and to weathering.

The deposit of volcanic ash of such thickness must have had a profound effect on the vegetation that existed at the time. Stumps in situ and undecomposed plant remains in peat below the ash suggest that the flora at the time of the deposit was similar to that of to-day.

In a fresh road-cut just north of Lapie bridge the following stratigraphy was observed:

Cm.	
0–57	Peat or raw humus mixed with wind-blown sand containing tree roots and pieces of charred wood.
58–73	Thin bands of peat containing lacustrine molluscs alternating with bands of fine sand.
74–84	White volcanic ash.
85–90	Peat containing charred wood.
91–100	Sand with thin bands of peat.
101–150	Unsorted glacial till containing very large boulders. Deepest root penetration was found in the upper part of this till.
151–400	Finer glacial till followed by an undetermined thickness of fine sand. The sand is crossbedded by a network of fine "fossil" frost fissures. Some larger fissures were filled with strongly compacted and cemented gravel.

On a terrace situated approximately 50 feet above the present level of Lapie River, an outwash fan about half a mile long and a quarter mile deep has been formed by a stream from the mountain east of the bridge. Even in flood this stream is now merely a mountain brook that dries out completely in late summer. The fan now carries a dense stand of mature white spruce mixed with paper birch. The forest floor everywhere is covered by usual ground vegetation. A pit that was dug here revealed the following stratification:

Cm.	
0–12	Hard, fibrous layer of undecomposed humus.
13–20	Fine silt, probably aeolian.
21–35	Fine sand, probably aeolian.
36–55	Raw humus containing non-decomposed wood; directly under this a thin layer of charcoal.
56–65	Coarse washed gravels.
66–100	An undetermined thicket of compacted and firmly cemented coarse gravel. No root penetration beyond 55 cm. No volcanic ash.

Grassland Soils

Rich subalpine prairie or meadows possessing a floristic element, which in Yukon is peculiar to such relic grassland, occur in a number of places along Canol Road. Some of the best examples were found near the base of Mount Sheldon (Plots Nos. 1–5) and in the valley of the south branch of Macmillan River (Plots Nos. 6–8). Some meadows near Mile 222 at an elevation of 3,500 feet and situated on the north spur of Mount Sheldon are obviously kettle-holes which have been filled by rapid sedimentation; more extensive grassland was seen at higher elevations, in the saddle between Mount Sheldon and Mount Riddell and again on the south side of the south branch of Macmillan River, near Mile 250; these meadows, likewise, owe their origin to sedimentation, but the mechanics of their genesis is clearly not the same.

A number of pits were dug in such meadows, some to a depth of 2 metres. Only in one was a layer of volcanic ash found, and in none was permafrost disclosed or temperatures that suggest that permafrost is found below these meadows. Acidity of samples taken from these pits was determined colorimetrically from centrifuged soil solution following soaking air-dried soil samples in distilled water for 24 hours. Determination of moisture content and loss by ignition was made on samples passing a 2m/m sieve.[1]

Plot (1)—Pit dug into low ridge in meadow. Primary spp.: *Festuca altaica, Delphinium glaucum, Thalictrum sparsiflorum, Epilobium angustifolium, Polemonium acutiflorum, Mertensia paniculata, Arnica mollis,* and *Artemisia Tilesii* var. *elatior.*

Cm.
0–10......Peaty turf.
11–31......Fine, black loam penetrated by grass roots. pH: 5·7; moisture: 1·7 per cent; ignition loss: 13·1 per cent.
32–50......Firmly compacted, sharp, shaly gravel mixed with a few rounded pebbles. Total root penetration 50 cm.

Plot (2)—Level meadow with hummocks of *Festuca altaica, Solidago decumbens* var. *oreophila, Achillea nigrescens,* and *Mertensia paniculata.*

Cm.
1–10......Peaty turf.
11–30......Fine, shaly, and very friable gravel. pH: 6·4; moisture: 0·3 per cent; ignition loss: 5·3 per cent.
31–75......Fine, loamy clay. Grass-root penetration to 40 cm. pH: 6·3; moisture: 5·0 per cent; ignition loss: 7·2 per cent.

Plot (3)—Level meadow with almost pure stand of *Delphinium glaucum.*

Cm.
1–60......Black, rich loam penetrated by roots. pH: 6·1; moisture: 2·7 per cent; ignition loss: 9·6 per cent.
64–undetermined depth. Black loam without roots. pH: 5·8; moisture: 1·2 per cent; ignition loss: 8·1 per cent.

Plot (4)—Meadow composed entirely of *Festuca altaica.*

Cm.
1–75......Fine, friable, shaly gravel. pH: 5·7; moisture: 1·0 per cent; ignition loss: 5·4 per cent.
76–undetermined depth. Rich, black loam without grass roots. pH: 5·9; moisture: 3·0 per cent; ignition loss: 10·5 per cent.

Plot (5)—Extensive level meadow or prairie, at an elevation approximately 500 feet above that of plots Nos. 1–4. Primary spp.: *Calamagrostis canadensis* var. *Langsdorffii, Thalictrum sparsiflorum, Heracleum lanatum,* and *Mertensia paniculata.*

Cm.
1–15......Thick fibrous turf.
16–45......Black loam. pH: 5·5; moisture: 1·5 per cent; ignition loss: 8·9 per cent.
46–51......Volcanic ash. pH: 6·0; moisture: 0·3 per cent; ignition loss: 8·1 per cent.
52–58......Black loamy clay
59–64......Fine, friable gravel
65–80......Heavy black clay
} Thoroughly mixed sample analysed: pH: 5·5; moisture: 3·0 per cent; ignition loss 8·4 per cent.

Below 80 cm. fine gravel mixed with clay. pH: 5·4.

Plot (6)—Extensive prairie on benches south of south branch of Macmillan River approximately one mile from river-bank. These prairies are surrounded by extensive black spruce muskeg on boulder clay or by eskers of washed gravel. (Plate V B and Plate VI A and B).

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[1] Soil analyses were made by Dr. C. Heimburger, Toronto, formerly of Department of Mines and Resources, Ottawa.

Cm.	
1–5	Fibrous turf of grass roots.
6–25	Dark loam with bands of coarse sand. pH: 5·4; moisture: 0·4 per cent; ignition loss: 3·2 per cent.
26–56	Peaty matter with grass roots and poorly decomposed bog vegetation mixed with stiff, dark-coloured clay, crossbedded by numerous rust-stained tiny crevices through which grass roots had penetrated. Crevices indicate that this strata once was frozen when much wetter than now. pH: 5·2; moisture: 1·0 per cent; ignition loss: 6·9 per cent.
57–91	Dark-coloured, stiff clay of such low water content that it feels dry and when squeezed in the hand, breaks into small, angular particles. Lowest penetration of live grass roots. pH: 5·7; moisture: 1·1 per cent; ignition loss: 3·9 per cent.
92–192	Uniform and very homogeneous, dark-coloured, stiff clay (gumbotil) lacking plant roots. pH: 5·7; moisture: 1·3; ignition loss: 3·3 per cent. Although dry to the feel, this layer is plastic and not friable when squeezed. It lacks the fine fissures and probably was never frozen since it was laid down.
193–200	Fine, cherty gravel and sand with a few bits of charcoal mixed with stiff clay. No water formed in pit, but gravel wet below 2-metre level. On August 24 the temperature of the soil at a depth of 115 cm. was 43°F., and at the bottom of the pit at a depth of 200 cm. it was 42°F. This is a surprisingly high temperature in view of the fact that at a depth of 2 metres the lower range of seasonal variation should have been reached.

Plot (7)—in a nearby black spruce muskeg.

Cm.	
1–30	Sphagnum moss with roots and raw humus.
31–60	Very wet boulder clay resting on permafrost.

Plot (8)—Glacial drumlin or esker on lower slope of valley near Mile 268.

Cm.	
1–10	Moss and lichen.
11–15	Volcanic ash.
16–25	Fine, grey-coloured gravel and sand.
26–35	Leached fine gravel and sand.
36–55	Hardpan formed of dark, rust-coloured gravel firmly cemented together, but easily broken when hammered.
56–undetermined thickness of unstratified sand and gravel with small boulders.	

PEAT DEPOSITS AND PINGOS (EARTH MOUNDS)

True peat deposits were not seen along Canol Road, but accumulations of raw humus were frequently noted on lee shores of lakes and ponds or in swamps and bogs.

In Macmillan Pass were noted several fine examples of *pingo* or frost mound formation (Porsild, 1945). In a swampy basin formerly occupied by a shallow lake, several such mounds were being formed by frost action of the type described by Porsild (1938). The *pingos* were rather small and immature, the largest being 150 by 50 feet and about 10 feet high. Pits dug into the summits of the *pingos* disclosed a fine-grained homogeneous black peat. In the peat were numerous well-preserved rhizomes of *Menyanthes trifoliata* and other bog plants, showing that the peat had been formed in shallow water. *Menyanthes* does not now grow in the swamp or elsewhere in Macmillan Pass, a fact that may indicate a slight deterioration of climate. Permafrost was found at a depth of 60 centimetres. Remnants of similar *pingos* were noted on the upper south fork of Macmillan River at 4,200 feet elevation where the road had cut through a peat deposit 3 to 4 metres thick. The exposed section showed updoming of the layers of peat characteristic of *pingo*-formation.

In a number of places were noted considerable deposits of peat or raw humus containing tree trunks and roots which had been buried under glacial till. Such deposits are frequently formed by landslides in areas of permanently frozen subsoil (permafrost).

ECONOMIC BOTANY

Owing to the general high elevation and severe climate of the region covered by the present report, the possibilities for agricultural development are limited and restricted to lowlands along the main rivers. The economic importance of the native flora is largely limited to the timber resources described on pages 27-29 and, indirectly, to food and grazing for wildlife (Rand, 1949).

During August and early September many kinds of small fruits including red currants, raspberries, cloudberries, cowberries and bilberries are abundant. In spring and summer the young shoots and leaves of mountain sorrel (*Oxyria*) and broad-leaved willow herb (*Epilobium latifolium*) are abundant almost everywhere and may be used as greens or pot herbs, while from July on there are many kinds of edible mushrooms.

Successful gardens have been grown for many years at Ross Post on the Pelly River where the principal crops, in 1944, were potatoes, carrots, radishes, and lettuce. Similar small-scale gardening is, no doubt, possible in a number of other places in the lowland.

HISTORY OF BOTANICAL EXPLORATION IN THE YUKON

In the preparation of his Flora of Alaska and Yukon, of which the first part was published in 1941, Dr. Eric Hultén in 1938, studied the Yukon material in the herbaria of the National Museum of Canada, Harvard University, New York Botanical Garden, U.S. National Museum, as well as a number of other herbaria having significant collections of Alaska and Yukon plants. In preparation of his flora Dr. Hultén published a "History of Botanical Exploration in Alaska and Yukon Territories from the time of their discovery to 1940" (Hultén, 1940). The wealth of information contained in Hultén's paper has been of inestimable help in the preparation of the present volume. In the following list a number of Yukon collections, of which the writer has no first-hand information, are cited on Dr. Hultén's authority.

CHRONOLOGICAL LIST OF THE MORE IMPORTANT COLLECTIONS OF VASCULAR PLANTS MADE IN THE YUKON

1848–50. W. J. S. Pullen, lieutenant in the Royal Navy, accompanied Captain Kellett in H.M.S. *Herald* during the Franklin Searching expeditions. In 1850 Pullen travelled by boat from Wainwright, Alaska, following the north coast of Alaska and Yukon to Mackenzie River. En route he collected a number of plants, which are now in the herbarium of Kew

Gardens. A list was published by Berthold Seemann in the appendix to his Botany of the Voyage of H.M.S. *Herald*, London, 1852. For most of the plants no exact locality is given, and those collected along the Arctic Coast are merely labelled "Arctic Coast, between Point Barrow and Mackenzie River" or "Point Barrow to Bear Lake River." Although some of Pullen's plants may actually have been collected along the arctic coast of Yukon, the list is of little value from a phytogeographical point of view. In the light of our present knowledge it is obvious that plants such as *Corispermum hyssopifolium, Ribes lacustre,* or *Mulgedium* [*Lactuca*] *pulchellum,* which in Pullen's list are said to have been collected between Point Barrow and Mackenzie River, must actually have been collected on the Mackenzie at a considerable distance above its mouth.

1883. Frederich Schwatka, lieutenant in the U.S. Army, in 1883 crossed from the Pacific Coast to Yukon River, which he descended to the sea. A few plants were collected by him and were named by Sereno Watson; at least some of them are in the Gray Herbarium.

1887. George Mercer Dawson of the Geological Survey of Canada ascended the Frances and Finlayson Rivers following the route discovered by Robert Campbell, in 1840. From Finlayson Lake, Dawson descended Pelly River to the Yukon. A number of plants were collected along the route and along upper Yukon River and Lewes River. Dawson's copious notes about tree growth and the vegetation in general are published in Ann. Rept., Geol. Surv., Canada, N.S., vol. 3A, Appendix I: Notes on the distribution of trees and of certain shrubs, etc. and in Appendix III: List of plants collected by Dr. G. M. Dawson in Yukon district and adjacent part of northern British Columbia, in 1887, by John Macoun. The plants are in the National Herbarium, Ottawa.

1887. Wm. Ogilvie, surveyor of Dawson's expedition, collected a few plants along the Lewes and upper Yukon Rivers which are incorporated in Macoun's list.

1887–88. R. G. McConnell of the Geological Survey of Canada, also a member of Dawson's party, crossed from Mackenzie Delta by way of Rat River to the Porcupine, which he descended to Fort Yukon. The return trip was up the Yukon to Skagway via Chilcat Pass. A few plants, collected between Mackenzie River and the Porcupine, are in the National Herbarium, Ottawa. *Papaver McConnellii* Hultén was named for him.

1893–94. Frederick Funston of the U.S. Department of Agriculture, in the spring of 1893 travelled via Chilcat Pass and Tagish Lake to Dawson district where he collected plants mainly near Fortymile and nearby Coal Creek. Later he ascended Porcupine River to Rampart House where he spent the winter of 1893–94, returning to Fort Yukon in June 1894. His main collections are in the U.S. National Herbarium, Washington, D.C.; a few duplicates are in the National Herbarium of Canada, and elsewhere. *Lychnis funstoni* Wight (=*Melandrium affine*) was named for him.

1894. Otto Klotz of the Dominion Observatory, Ottawa, collected a few plants along the Alaska-Yukon boundary.

1898–1901. J. MacLean of the U.S. Signal Corps collected plants at Dawson and at Klondike. At least some of his plants are in the herbarium of the University of California. *Haplopappus MacLeani* Brandegee [*Stenotus borealis*] was named for him.

1898–1900. A. L. Bolton of the U.S. Geological Survey collected a few plants on Dominion Creek southeast of Dawson. The plants are in the U.S. National Herbarium.

1898–99. M. W. Gorman made important collections of plants along Yukon River between White Pass and Dawson City. His main collection is in the U.S. National Herbarium; a number of duplicates are in the National Herbarium of Canada, and elsewhere. *Penstemon Gormani* Greene, *Douglasia Gormanii* Constance, and *Erigeron Gormanii* Greene (=*E. compositus* var. *trifidus*) were named for him.

1898. Fr. Anderson was a member of Otto Nordenskjöld's expedition to Yukon. His collection of plants from the upper Yukon and from Dawson district is in the National Museum, Stockholm.

1898–99. R. S. Williams, bryologist of the New York Botanical Garden, made a large collection of bryophytes and also collected some vascular plants, chiefly in Dawson district. A catalogue of his collection was published in Bull., N.Y. Bot. Garden, vol. 2, 1901. The vascular plants are dealt with by Britton and Rydberg, the ferns by Underwood, the hepatics by Howe, and the mosses by Williams. The main collection is in the herbarium of the New York Botanical Garden; some duplicates have been distributed to other herbaria. *Carex Williamsii* Britt., *Astragalus Williamsii* Rydberg, and *Silene Williamsii* Britt. were named for him.

1898. J. B. Tyrrell of the Geological Survey of Canada, during the spring and summer of 1898, made a small collection of plants in Dawson district, chiefly on Bonanza and Hunker Creeks, Dawson City, Chandindu and Fortymile Rivers. A list of the plants, of which very few are now in the National Herbarium of Canada, was published by John Macoun in the Ottawa Naturalist, vol. 13: 209-218 (1899). *Artemisia Tyrrellii* Rydberg (= *A. alaskana*) was named for him.

1899. J. B. Tarleton collected about 270 plants for the U.S. National Herbarium in Yukon Valley between Five-finger Rapids and Dawson. The phanerogams were named and catalogued, together with the collection made by R. S. Williams, by Britton and Rydberg, in Bull., N.Y. Bot. Garden, vol. 2, 1901. *Astragalus Tarletonis* Rydberg was named for him.

1902. John Macoun, botanist of the Geological Survey of Canada, made a large collection of plants in Yukon Valley between Whitehorse and Dawson. The main collection is in the National Herbarium, Ottawa; duplicates are in the Gray Herbarium, the herbarium of the New York Botanical Garden, the U.S. National Herbarium, and elsewhere. No report on his collection was ever published, but a number of specialists have studied his material.

1906. Godfred Hansen and *A. H. Lindström,* members of Amundsen's expedition in the *Gjöa,* collected plants at King Point on the arctic coast of Yukon. A critical list of the plants was published by C. H. Ostenfeld in Vidensk.-Selsk. Skr., Math.-Naturv. Kl. 8, Kristiania, 1910. The main collection is in Copenhagen and Oslo; a few duplicates are in Ottawa and elsewhere. *Senecio Lindstroemii* Porsild was named for A. H. Lindström.

1909. A. S. Hitchcock, agrostologist of the U.S. Department of Agriculture, Washington, D.C., with R. S. Kellogg of the U.S. National Forest Service, between July 13 and July 19 visited places along the Yukon between Whitehorse and Dawson. The plants collected by them are in the U.S. National Herbarium.

1908–1917. D. D. Cairnes of the Geological Survey of Canada collected vascular plants in Yukon, chiefly along the 141st Meridian and in the Wheaton and Klotassin districts. Lists of Cairnes' plants were published by J. M. Macoun in Summary Rept., Geol. Surv., Canada, 1911 and 1912. *Anemone Cairnesiana* Greene (= *A. multiceps*) and *Koeleria Cairnesiana* Hult. were named for him, and a monotypic genus, *Melanidion* Greene, was based on his collection.

1912. D. H. Nelles of Ottawa, in charge of an International Boundary Commission party, made a small collection of 43 plants along the Alaska-Yukon boundary south of Porcupine River, in approximate latitude 67° N. The collection is in the National Herbarium at Ottawa.

1913–1914. Frits Johansen and *R. M. Anderson,* members of the Canadian Arctic Expedition, 1913–18, collected a few plants at Herschel Island and at Shingle Point, Yukon. Their collections are embodied in the botanical report of the expedition by Macoun & Holm in Rept., Can. Arct. Exp. 5, part A, 1921.

1913. I. O. Stringer, missionary, collected a few vascular plants at Herschel Island. The plants, which are in the National Herbarium, Ottawa, were listed by Macoun & Holm, l.c.

1914. Alice Eastwood, curator of the Herbarium of the California Academy of Sciences, San Francisco, Cal., made a large collection of plants for the Arnold Arboretum of Harvard University, chiefly on the upper Yukon and in Dawson district. Duplicates of the collection are in the National Herbarium, Ottawa, the herbarium of the California Academy, U.S. National Herbarium, and elsewhere.

1916. M. O. Malte, late chief botanist of the National Museum of Canada, made a brief visit to Yukon where he collected in the vicinity of Dawson. The collection, which was never reported upon, is in the National Herbarium, Ottawa.

1918. W. E. Cockfield, geologist of the Geological Survey of Canada, collected a few plants, chiefly in Mayo district. The plants, which are in the National Herbarium, Ottawa, are cited in the present report.

1920. Adolf Müller, big-game hunter, collected plants in southeast Yukon, chiefly in Kluane Lake district and around Lake Dezadeash. His collection is in the herbarium of the Philadelphia Academy of Sciences; duplicates are in the National Herbarium of Canada, Gray Herbarium, the U.S. National Herbarium, and elsewhere.

1922–1946. J. P. Anderson, formerly florist at Juneau, Alaska, now at the Botany Department, Iowa State College, Ames, Iowa, in June 1922 made a trip down the Yukon from Whitehorse to Dawson. Except for a few numbers, which are in the herbarium of the New York Botanical Garden, the collection was lost in 1924, when Anderson's large private collection of Alaska plants was destroyed by fire. In July and August, 1944, Anderson again visited Yukon and collected plants along Alaska Highway at White River bridge, the south end of Kluane Lake, and at Whitehorse. From Whitehorse he made a brief visit to Mayo. In 1946, accompanied by Mr. and Mrs. Robert Brown, he collected plants along Alaska Highway, chiefly at Watson Lake and at Mackintosh. Anderson's main collection of Alaska-Yukon plants is in the herbarium of Iowa State College. Large and beautifully prepared duplicate sets are in the National Herbarium of Canada, Riksmuseet, Stockholm, and elsewhere. In 1943, Anderson published the first part of a "Flora of Alaska and Adjacent Parts of Canada" of which seven parts (including *Plumbaginaceae*) have appeared in Iowa State College Journal of Science.

1927. *Martha Louise Black* (Mrs. George Black), from 1935 to 1940 Member of Parliament for Yukon, during her 50 years, residence at Dawson, Yukon, has collected and photographed Yukon wild flowers. A few of the plants collected by Mrs. Black near Mayo, about 1927, are in the National Herbarium of Canada.

1930. *H. E. Parks* of Alborg, Oregon, collected some plants between Carcross and Whitehorse. The collection is in the herbarium of the University of California, Berkeley, Cal.

1932. *W. A. Setchell*, Professor of Botany, University of California, travelled to Alaska by way of the Yukon route. Collections, which consisted largely of willows, were made between Carcross and Dawson, between June 13 and 17. The main body of the collection is in the herbarium of the University of California and in the herbarium of C. R. Ball. *Salix Setchelliana* Ball was named for him.

1932–35. *A. E. Porsild*, chief botanist of the National Museum of Canada, then stationed in the Mackenzie Delta, collected plants along the arctic coast of Yukon, chiefly at King and Kay Point. A number of his collections are listed in Sargentia 4 (1943).

1933– *Hugh S. Bostock*, geologist of the Geological Survey of Canada, during seventeen seasons of field work in Yukon has contributed a number of small though important collections of vascular plants, chiefly from Mayo and McQuesten areas, and Dawson Range. The Bostock collections, which are in the National Herbarium at Ottawa, include a large number of first records for the Yukon; these are enumerated in the present paper where also *Claytonia Bostockii* Porsild is described.

1944. *C. H. D. Clarke*, biologist of the Department of Lands and Forests, Toronto, Ont., in the course of a biological reconnaissance of southeastern Yukon, sponsored by the National Parks Bureau of Ottawa, collected a number of plants, chiefly around Burwash Landing on Kluane Lake and along Haines Road (Lake Dezadeash). His botanical collections, which are in the National Herbarium at Ottawa, include a number of important additions to the Yukon flora; these are enumerated in the present paper.

1943, *1944*, and *1948*. *Hugh Miller Raup*, Professor of Botany, Arnold Arboretum, Harvard University, during three seasons in the Yukon has carried out extensive studies of the flora and the development of vegetation and soils along Alaska Highway between Watson Lake and the Alaska boundary. His principal collecting areas are as follows: 1943 – Vicinity of Watson Lake and the vicinity of Mount White. 1944 – Pine Creek, about 100 miles west of Whitehorse and the southeastern end of Kluane Lake. 1948 – Area between Champagne and Bear Creek and along the Haines Road chiefly in the Dalton Pass region, lower Duke River and around the northwest end of Kluane Lake, mountains north of Kluane Lake to headwaters of Nisling River. His very large collections have not yet been reported upon.

1944. A. E. Porsild, chief botanist of the National Museum of Canada, Ottawa, assisted by A. J. Breitung, spent three months collecting plants along Canol Road in southeast Yukon. The collection, which comprises 3,041 numbers with approximately 18,000 specimens, forms the basis of the present monograph. The main collection is in the National Herbarium, Ottawa. Duplicate sets are in the herbarium of the National Museum, Stockholm, Sweden; the Gray Herbarium, Harvard University, Cambridge, Mass.; the U.S. National Herbarium, Washington, D.C.; the herbarium of the University of California, Berkeley, Calif.; the herbarium of the University of Washington, Seattle, Wash.; the herbarium of Iowa State College, Ames, Iowa; and the herbarium of the New York Botanical Garden.

1944. W. Huddelson, mining engineer, collected a few plants on Golden Horn mountains south of Whitehorse. *Oxytropis Huddelsonii* Porsild is named for him.

1947. Morten P. Porsild of Copenhagen, Denmark, formerly Director of the Danish Arctic Station, Disko, Greenland, and R. T. Porsild of Whitehorse, Yukon, collected plants chiefly in the vicinity of Whitehorse and Johnson Crossing. A complete set of the collection is in the National Herbarium, Ottawa, and a second set in the Botanical Museum, Copenhagen. The more significant numbers in the collection are cited in the present paper.

1947. R. L. Christie, assistant to Dr. Hugh S. Bostock of the Geological Survey of Canada, collected plants, chiefly in McQuesten River area. The collection is in the National Herbarium at Ottawa.

1948. John D. Campbell, botanist attached to a party led by Dr. Hugh S. Bostock of the Geological Survey of Canada, collected plants in the McQuesten River area, between latitudes 63° and 64° N. and longitudes 136° and 138° W. His collection of 772 numbers of vascular plants is in the National Herbarium of Canada but came into my hands too late to be reported upon in the present report.

PLANT COMMUNITIES OF THE YUKON SECTOR OF THE CANOL ROAD

INTRODUCTORY

In the field much time was spent studying plant communities and compiling copious and detailed plant lists. These notes were in the form of local check-lists and comprised records of vertical distribution, frequency, and phenology. At the end of a day's collecting, field determinations were checked and field numbers entered in the check-lists. In the final typed form the notes comprise 150 pages.

It was originally planned to organize this mass of ecological material into conventional form by consolidating the field lists into readily comparable tables. When this was attempted, it was soon realized, however, that owing to floristic, edaphic, altitudinal, and other differences, the difficulties entailed in the synthesization were so great that the results obscured rather than clarified the often none too clear relationship of plant communities.

In the following pages the writer has attempted, instead, to list some of the more important and clear-cut plant communities observed along the Yukon sector of Canol Road, following which he gives descriptions of the more characteristic aspects of the vegetation illustrated by actual plant lists which have been selected as representative of a cross-section of the most significant plant communities noted.

(*A*) *Forests*

Because of the general high relief of the Yukon sector of Canol Road, forests are mainly restricted to the valley systems. The principal forest-forming species are lodgepole pine (southern part only), alpine fir, white and black spruce, and aspen. Other tree-like species, which are a component of the forest but rarely form pure stands, are balsam poplar, paper birch, grey alder, and larch; the last was not seen along the Yukon part of Canol Road, and in southeastern Yukon thus far has been reported only from the Liard-Pelly watershed.

Because prevailing winds are from west and south, large masses of snow accumulate during winter on the lee side of mountains. Owing to the abundant moisture provided by melting snow, north and east slopes usually carry better stands of timber than do the warmer and often partly treeless south and west slopes. On north and east slopes the tree-line usually is found at an elevation of 4,500 feet, and about 1,000 feet higher on the south and west slopes. Near the Yukon-Mackenzie Divide the tree-line is depressed to about 4,000 feet.

The floor of narrow valleys, such as Nisutlin-Teslin Pass, Rose-Lapie Pass, or the upper south branch of Macmillan River, are treeless owing to the deep snow, which lasts well into the summer, whereas a dense scrub of fir extends up the mountain slopes to an elevation of 5,000 feet.

Good stands of timber are found only on rich, well-drained soils in places adequately sheltered against prevailing winds. The best and most extensive stands were seen in Nisutlin River Valley, around Quiet Lake, and at the base of Mount Sheldon where white spruce, fir, and balsam poplar measuring 18 inches at breast height were noted.

Raup (1945) has given an excellent account of the forests along the southern part of Alaska Highway. At his suggestion a similar mile-to-mile transect was made of the forests along Canol Road (Figure 3). Owing to the physiographic dissimilarities of the country through which these two roads pass, their forests are not directly comparable. The Canol Road between Johnson Crossing and Macmillan Pass follows rather narrow valley systems, whereas the British Columbia sector of Alaska Highway cuts across extensive dry foothills, terraces, and plateaux of much lower general elevation.

Five main forest types were recognized along Canol Road: (*See* Figure 2).

(1) White spruce - lodgepole pine - aspen. This is probably nearest to Halliday's upper Liard or Teslin boreal forest type (Halliday, 1937) and is the dominant forest type on well-drained soil of the valleys and lower slopes from Johnson Crossing to the south end of Rose-Lapie Pass.

(2) White spruce - balsam poplar (Halliday's Mackenzie lowland forest type) occupies the broad, comparatively low valleys of the Nisutlin, Pelly, and Mackenzie.

(3) White spruce forest with scattered paper birch and occasional black spruce occupies the higher, well-drained flood-plain and slopes of upper Rose-Lapie Rivers. It is also the principal forest type in Mackenzie Mountains.

(4) Black spruce forest mixed with some paper birch occupies the broad, heavily glaciated valleys of upper Ross River and the south branch of Macmillan River. It appears to be a climax type found on poorly drained glacial boulder clay where permafrost is close to the surface and where the forest floor remains wet and swampy throughout the summer.

(5) Alpine fir forest occupies moist slopes of Pelly Mountains and also the west slope of Mackenzie Mountains. Everywhere west of Macmillan Pass the fir is pre-eminently a timber-line species on moist north and east slopes. At timber-line it forms a low scrub that is severely depressed by snow pressure, but under favourable conditions it may attain a height of 80 feet or more with trunks up to 18 inches in diameter.

(B) Copses

Several low-shrub formations deserve mentioning, although none except *Betula occidentalis* scrub is of areal importance:

(1) *Betula occidentalis*, on well-drained glacial eskers, drumlins, and on river terraces, especially in Ross Valley, forms extensive thickets which are slowly being invaded by white spruce. In the extensive black spruce forest these islands, by their lighter colour, are discernible at a considerable distance and easily spotted from the air. Suitable gravel for road construction invariably is found where such birch scrub occurs.

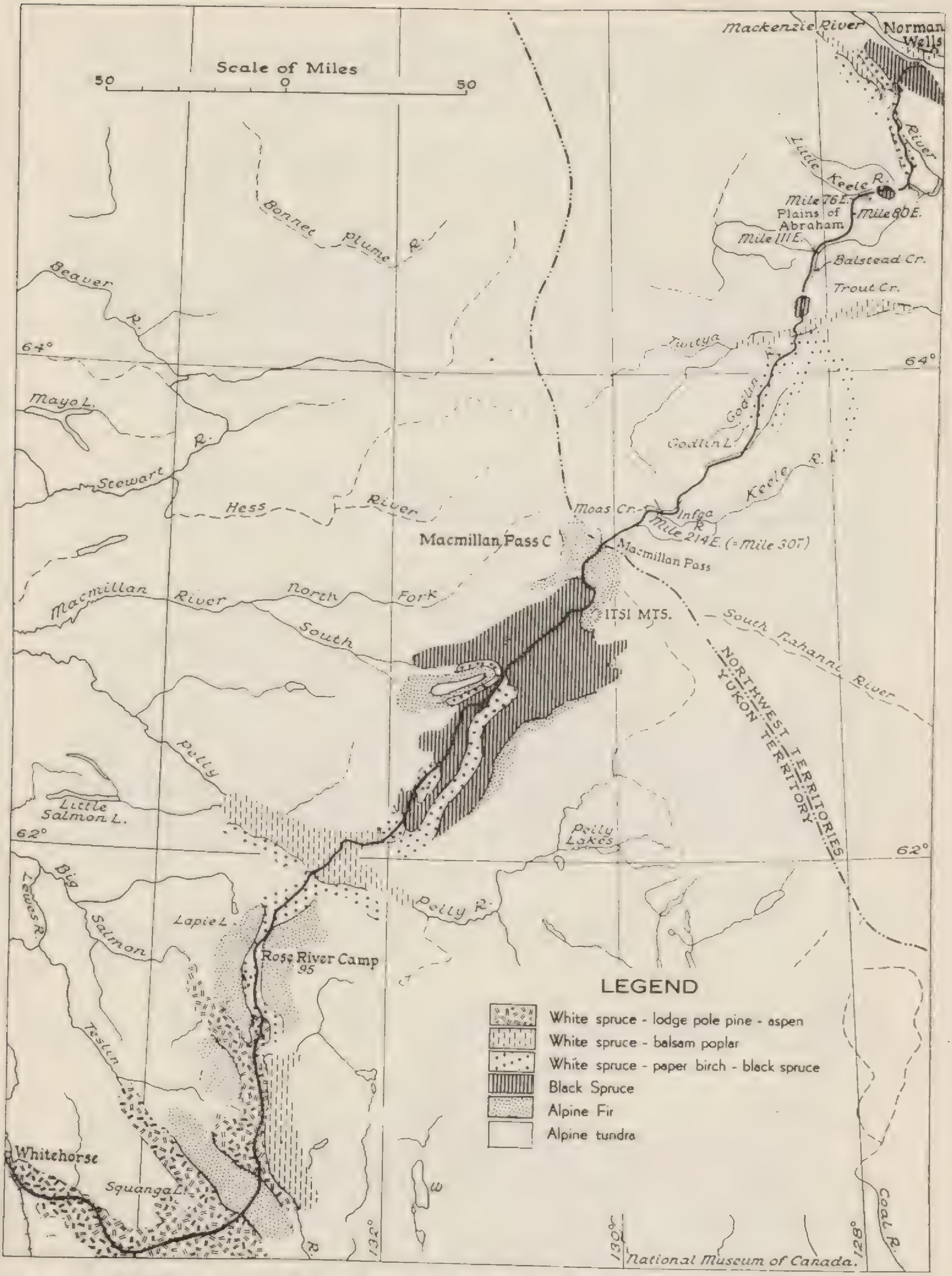

Figure 2. Map of Canol Road, Yukon and Northwest Territories, showing distribution of forests along the transect covered by the present report.

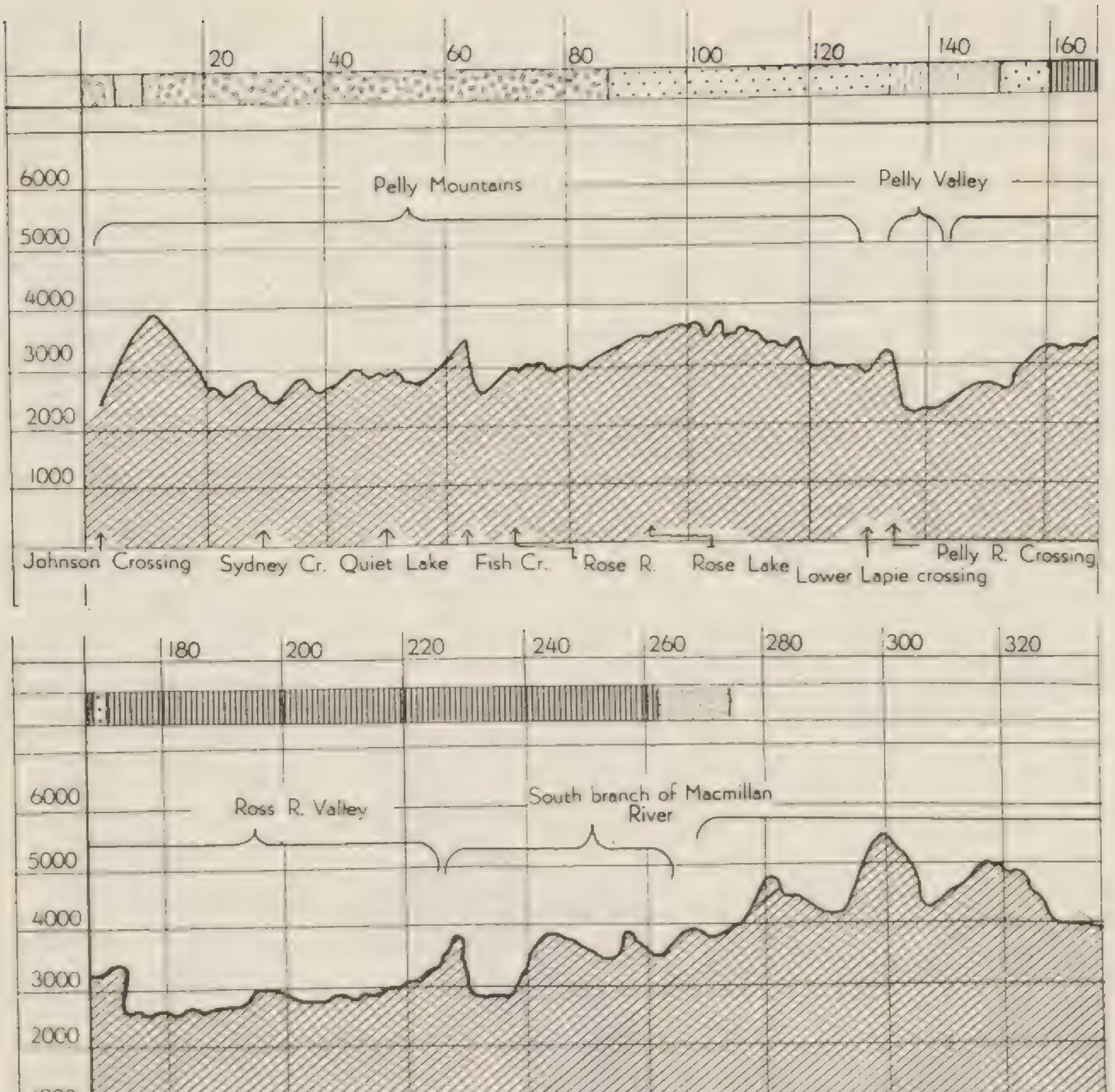

Figure 3. Profile of Canol Road showing the principal forest types based on a running mile-by-mile series of notes made during the several traverses of the road. Mileages and elevation are taken from "Profile of Pipeline traced from T S & P – O-G-737M," dated March 29, 1944.

(2) *Salix Barrattiana* forms almost pure thickets 2 to 3 feet high on well-watered alpine flats, especially in passes where there is a great accumulation of snow. By their light bluish grey colour these peculiar thickets contrast strongly against the darker green of other thicket-forming species.

(3) Willow and alder thickets are almost always found along riverbanks and alpine streams. The principal thicket-forming species are (a) *Salix longistylis*, which is best developed along riverbanks; (b) *Salix Scouleriana*, *S. planifolia*, and *S. arbusculoides* on burnt-over land; (c) *Salix Barclayi*, which forms almost pure thickets on moist mountain slopes and with *Alnus crispa* frequently forms borders along alpine streams near and below timber-line; and (d) *Salix pulchra*, which is ubiquitous above timber-line in depressions and creek beds where snow accumulates in winter.

(C) Meadows and Grassland

(1) Lowland meadows along the Canol Road are limited to Nisutlin River Valley, where they are found locally on flood-plains on alluvial soil.

(2) Peculiar subalpine meadows or prairies were noted chiefly in the valleys of Ross and Macmillan Rivers and are believed to be remnants of former and more extensive grasslands. They were invariably found on well-drained fertile soils up to the 4,000-foot level. A number of grassland species are peculiar to these meadows and were not noted elsewhere along Canol Road. On Lapie River a buffalo skull was found near the surface in such a meadow.

(D) Alpine Plant Communities

(1) Alpine "gardens" or herbmats. Of the large number of plant communities occurring above timber-line, the most remarkable and interesting are the rich alpine "flower gardens" peculiar to favourably exposed plateaux and gentle slopes on well-drained soil fed by water from snowdrifts or from water stored in the thick mantle of well-weathered soils of the upper slopes. Here, at elevations between 4,500 and 5,600 feet, the richest and most interesting assemblages of plants were found.

(2) Alpine heath characterized by dwarf shrubs, perennial herbs, grasses, and sedges.

(3) Lichen heath.

(4) The alpine snowflush herbmat is a distinctive community usually found in glacial cirques and near snowbanks that normally last until late in the season.

(5) Rocky slopes, cliffs, ledges, and ravines.

(6) Unstable rock screes and stone creeps.

(7) Subalpine outwash fans (erosion fans).

(8) Xeroseres: gravel-plate screes on south-facing mountain slopes.

(E) Lakes, Ponds, Lake Shores, and Sloughs

A number of different types of lakes and ponds were noted along the Canol Road, each possessing such plant life as the combined physiographic and edaphic conditions permitted. The principal controlling factors appear to be elevation, size, location, temperature of its waters, snow- and ice-cover in winter, stability of water level, turbulence, source of water supply, sedimentation, and pH values of water. Of primary consideration is, perhaps, if they are located in the alpine or lowland region. The former generally receive an abundant supply of cold water throughout the growing season, and those near timber-line, in consequence, are often completely lacking in vascular aquatic species or, at most, have a sparse marshy vegetation along the lee shores.

The lowland lakes, on the other hand, depending on whether they are fed by rivers or are more or less stagnant, show considerable diversity in the composition of their aquatic floras, which perhaps is mainly controlled by the relative acidity of their waters. Nearly all are surrounded by well-developed marshy borders in which *Equisetum limosum*, *Arctophila fulva*, *Arctagrostis arundinacea*, *Deschampsia caespitosa*, *Carex aquatilis*, *C. rostrata*, *C. physocarpa*, *Rorippa islandica* var. *microcarpum*, *Potentilla palustris*, and *Cicuta mackenzieana* are seldom lacking.

The aquatic flora of acidic lakes is usually poor in species. In the black spruce muskeg area of the Ross River valley, the predominant species appeared to be *Nuphar polysepalum*, *Hippuris vulgaris*, *Eleocharis acicularis*, *Menyanthes trifoliata*, and *Sparganium angustifolium*. A much richer aquatic flora was found in the neutral or slightly alkaline lakes of the Pelly Valley (pp. 48-49) and in those of the Mount Sheldon area (p. 55).

Not infrequently, small lakes and ponds lying side by side possess quite distinct aquatic floras. The spotty distribution, especially of the rarer aquatics, suggests dependence on birds for the dispersal of their seeds.

Sloughs, stagnant river channels, or oxbows, such as were noted on the Nisutlin and Ross Rivers, invariably proved the richest collecting grounds for aquatics and marsh plants. Marly lakes, apparently peculiar to the dry Pelly Valley, have been described on pages 48-9.

(F) Bogs and Mires

The flora which is characteristic of the swampy black spruce muskeg on permanently frozen ground has been described from the upper Ross Valley on page 50. Wet, boggy areas in the muskeg usually are inhabited by a small group of marsh species among which the following are rarely missing: *Equisetum arvense*, *Arctophila fulva*, *Carex aquatilis*, *C. physocarpa*, *Eriophorum angustifolium*, *E. Scheuchzeri*, *Salix myrtillifolia*, *Anemone Richardsonii*, *Cardamine pratensis*, *Potentilla palustris*, *Kalmia polifolia* var. *microphylla*, *Ledum groenlandicum*, *Petasites frigidus*, and *Senecio congestus*.

Bogs outside the permafrost area and generally on gently sloping ground through which water percolates (mires) are common at or near the timber-line. Characteristic for such bogs are:

Primary spp. *Carex aquatilis*, *C. physocarpa*, *Salix Barclayi*, *S. pulchra*, *Betula glandulosa*, *Potentilla palustris*, *Artemisia arctica*, and *Senecio triangularis*.

Secondary spp. *Lycopodium Selago*, *Carex brunnescens*, *C. gynocrates*, *C. leptalea*, *C. paupercula*, *C. canescens*, *C. tenuiflora*, *Eriophorum brachyantherum*, *Scirpus caespitosus*, *Salix commutata*, *Arenaria lateriflora*, *Aconitum delphinifolium*, *Anemone Richardsonii*, *Parnassia Kotzebuei*, *Potentilla* *fruticosa, Rubus Chamaemorus, Kalmia polifolia* var. *microphylla*, and *Pedicularis labradorica.*

In a common variation of this type of bog, *Scirpus caespitosus* forms almost 95 per cent of the vegetation cover. The species usually associated with it are: *Eriophorum angustifolium, Carex paupercula, Tofieldia pusilla, Parnassia fimbriata, Potentilla fruticosa, Andromeda Polifolia*, and *Oxycoccus microcarpus.*

A few instances of floating bogs or quagmires were noted in the subalpine meadows of the Mount Sheldon area. In these the floating carpet of vegetation, which was just able to support the weight of a man, consisted of *Carex paupercula, C. limosa, Scirpus caespitosus, Drosera anglica, Potentilla palustris, Oxycoccus microcarpus, Kalmia polifolia* var. *microphylla, Vaccinium uliginosum, Andromeda Polifolia*, and *Menyanthes trifoliata.*

(G) Succession on Burnt-over Land

All forests along Canol Road, except those growing on moist north and east slopes and near timber-line, at one time or other have been destroyed by fires. Even below the layer of volcanic ash, believed to have been deposited 1,400 years ago, may be found charred tree roots.

In the southern half of the area, aspen and willow probably always are first to occupy dry slopes on which the forest has been burned. Aspen and willow, in turn, give way to spruce, lodgepole pine, and alpine fir. We saw no evidence along Canol Road that lodgepole pine ever immediately follows fire, as is usually the case along Alaska Highway (Raup, 1945) and also in the drier climate of Whitehorse district and upper Yukon Valley.[1] North of Pelly River valley, white and black spruce forest perhaps always return to their original composition through a successional stage of willow and ground birch (*Betula glandulosa* and *B. occidentalis*).

Where the Canol Road crosses Pelly Valley, the succession following a fire was noted on south-facing slopes of low hills of weathered shale containing a few outcrops of rock. The fire that destroyed the white spruce forest about 20 years ago also completely destroyed the ground-cover and its layer of humus. Here the following succession was noted:

On the lower slope:

Primary spp.: *Agropyron dasystachyum, Calamagrostis purpurascens, Carex obtusata, Arctostaphylos Uva-ursi*, and *Artemisia frigida.*

Secondary spp.: *Fragaria yukonesis, Rosa acicularis, Penstemon Gormani, P. procerus*, and *Solidago decumbens* var. *oreophila.*

On gentle slope near the summit:

Primary spp.: *Populus tremuloides, Epilobium angustifolium, Shepherdia canadensis*, and *Arctostaphylos Uva-ursi.*

Secondary spp.: *Festuca altaica, Zygadenus elegans*, and *Lupinus arcticus.*

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[1] Dr. Hugh S. Bostock has informed me that at Carmacks and also at Pelly Farm and Needlerock Creek on lower Pelly River, lodgepole pine returns after a fire.

On the level summit:

Primary spp.: *Picea glauca* var. *albertiana* (a few trees, some showing fire scars, escaped the fire), *Populus tremuloides, P. tacamahacca, Salix glauca* var. *perstipula, S. Scouleriana,* and *Arctostaphylos Uva-ursi.*

Secondary spp.: *Pyrola secunda* and *Mertensia paniculata.*

(H) Apophytes and Anthropochorous Plants in Southeastern Yukon

The rapid construction of many hundreds of miles of highway, as well as an even greater number of miles of subsidiary or temporary pilot roads or right of way for pipelines through the wilderness of northern British Columbia, Yukon, and Alaska, afforded a unique opportunity for a number of plants to occupy freshly cleared and vigorously disturbed soils.

As the road-building equipment used by the roadmakers was almost entirely mechanized, horses were rarely used except during the earliest surveying. A few farm weeds were brought in with fodder for horses. Along Canol Road such weeds were, in the second year of the road, still limited to the immediate vicinity of former stables and to paddocks where horses had been grazed. Along the Alaska Highway, on the other hand, the heavy traffic of vehicles coming from well-established agricultural centres in the south continued to bring seeds of a number of ubiquitous weeds that in 1944 were seen flourishing along the roadside. The introduced weeds most frequently observed in 1944 along Canol Road were: *Hordeum jubatum, Polygonum heterophyllum, Trifolium hybridum, T. pratense, T. repens, Melilotus albus, M. officinalis, Taraxacum officinale,* and *T. vagans.*

Besides furnishing unique opportunities for plants to occupy freshly cleared land, the road equipment itself provided abundant opportunities for both local and long-distance dispersal of plants in the caterpilllar treads used on most of the heavier machinery, which readily pick up soil and seeds. To avoid cutting up the road surface, such equipment, moreover, when moved for short distances, frequently travelled along the shoulders of the road and in doing so would readily pick up plant seeds. For long hauls such heavy road equipment was transported on trucks or on special trailers when the soil and seeds adhering to the treads would often be carried great distances.

Three native plants that particularly owe their rapid spread along the new roads to this means of dispersal are *Corydalis aurea, Mertensia paniculata,* and *Arnica cordifolia* ssp. *genuina.* In the first, the seeds are small and very numerous. In its native habitat it is restricted to wet clay and gravel on river-banks and to fresh slides where, although by no means rare, it is seldom very abundant. Its rapid spread along the Alaska Highway and Canol Road was phenomenal. *Mertensia paniculata* and *Arnica cordifolia* are both very common species and inhabit a number of varied habitats. The road merely gave them added opportunities, of which, due to their aggressiveness, they were quick to take advantage.

The pilot roads and the clearings made for the pipeline only served a short time as roads for tractors and road equipment and when the main road had been completed were abandoned as arteries of traffic. When these temporary roads were made, "bulldozers" merely pushed through the forest, uprooting the trees and removing the natural vegetation so that the fresh subsoil everywhere was exposed. A tangle of fallen trees and tree roots was left by the roadside. In muskegs and in wet places on permafrost the frozen ground rapidly thawed, transforming these "roads" into wet, boggy ditches. On sloping ground, erosion soon transformed the ditches into gullies, but on level ground, bog plant communities already in the second year became firmly established. Characteristic of such wet, man-made habitats are the following: *Alopecurus aequalis, Arctagrostis arundinacea, Chenopodium capitatum, Ranunculus Gmelini* f. *terrestris, R. sceleratus* ssp. *multifidus, Corydalis aurea, C. sempervirens, Descurainia Richardsonii, Rorippa islandica* var. *microcarpa, Chrysosplenium tetrandrum, Phacelia Franklinii, Dracocephalum parviflorum, Erigeron lonchophyllus,* and *Senecio congestus.*

In the following list is given some of the native and indigenous species that, in the second summer after construction started, were most obviously favoured by, and owed their rapid spread and luxuriance to, road construction.

Primary spp.: *Arctagrostis arundinacea, Agropyron trachycaulum, Agrostis scabra, Calamagrostis canadensis, Puccinellia Nuttalliana, Corydalis aurea, Descurainia Richardsonii, Epilobium angustifolium, Phacelia Franklinii, Mertensia paniculata, Achillea nigrescens, Arnica cordifolia* ssp. *genuina, Artemisia Tilesii* var. *elatior,* and *Taraxacum vagans.*

Secondary spp.: *Calamagrostis lapponica* var. *nearctica, Poa alpina, P. glauca, Juncus castaneus, Chenopodium capitatum, Rumex alaskanum, Monolepis Nuttalliana, Stellaria longipes, Aquilegia brevistyla, Ranunculus Cymbalaria, R. Gmelini, R. sceleratus* ssp. *multifidus, Corydalis sempervirens, Rorippa islandica* var. *microcarpa, Barbarea orthoceras, Draba glabella, Arabis hirsuta* ssp. *pycnocarpa, Erysimum cheiranthoides, Rubus strigosus, R. arcticus, Potentilla fruticosa, P. norvegica, Fragaria glauca, Geum macrophyllum* var. *perincisum, Rosa acicularis, Astragalus alpinus, Epilobium glandulosum, Lappula Redowskii* var. *occidentalis, Dracocephalum parviflorum, Aster sibiricus, Erigeron lonchophyllus, Petasites frigidus, P. sagittatus, P. palmatus, Senecio congestus, S. lugens,* and *Crepis elegans.*

VEGETATION OF THE TESLIN-NISUTLIN PASS

From Johnson Crossing on Teslin River (Mile 0, elevation 2,250 feet) the Canol Road over an 11-mile grade climbs a 4,040-foot divide before descending into the broad Nisutlin River valley. On both sides of the pass, mountains rise to about 2,000 feet above road-level. The lower slopes of these mountains are covered with a low dwarf birch scrub among which grow scattered lodgepole pines (*Pinus contorta* var. *latifolia*). At road-level the vegetation on these slopes is as follows:

Primary spp.: *Pinus contorta* var. *latifolia, Calamagrostis canadensis* var. *Langsdorffii, Festuca altaica, Salix glauca, Betula glandulosa, Epilobium angustifolium,* and *Vaccinium Vitis-Idaea* var. *minus.*

Secondary spp.: *Agrostis scabra, Hierochloe alpina, Carex brunnescens, Aconitum delphinifolium, Empetrum nigrum, Gentiana glauca,* and *Pedicularis labradorica.*

The flat bottom of the pass is swampy and treeless, probably because the depth of snow that accumulates during winter makes the growing season too short.

Primary spp.: *Equisetum arvense, Festuca altaica, Salix Barrattiana, Betula glandulosa, Potentilla fruticosa, Sanguisorba sitchensis, Empetrum nigrum, Mertensia paniculata, Artemisia arctica,* and *Senecio triangularis.*
Secondary spp.: *Equisetum sylvaticum* var. *pauciramosum, Lycopodium clavatum* var. *monostachyon, Abies lasiocarpa* (depressed by snow), *Arctagrostis latifolia, Hierochloe alpina, Poa arctica, Carex aquatilis, C. canescens, C. deflexa, C. disperma, C. Lachenalii, C. macloviana, C. media, C. supina* ssp. *spaniocarpa, Eriophorum brachyantherum, E. russeolum* var. *leucothrix, E. Scheuchzeri, Scirpus caespitosus, Juncus castaneus, Luzula parviflora, Salix Barclayi, S. myrtillifolia, S. reticulata, Aconitum delphinifolium, Delphinium glaucum, Ranunculus Eschscholtzii, R. hyperboreus, Anemone Richardsonii, Cardamine umbellata, Chrysosplenium tetrandrum, Parnassia Kotzebuei, Potentilla diversifolia* var. *glaucophylla, P. palustris, Rubus arcticus, R. Chamaemorus, Sibbaldia procumbens, Astragalus alpinus, Hedysarum alpinum* var. *americanum, Empetrum nigrum, Epilobium anagallidifolium, E. angustifolium, E. Hornemannii, E. palustre, Pyrola asarifolia* var. *incarnata, P. minor, P. secunda* var. *obtusata, Kalmia polifolia* var. *microphylla, Ledum decumbens, Oxycoccus microcarpus, Vaccinium caespitosum, Trientalis europaea* var. *arctica, Gentiana glauca, Menyanthes trifoliata, Polemonium acutiflorum, Castilleja unalaschcensis, Pedicularis labradorica, P. sudetica, Veronica alpina* var. *unalaschcensis, Galium boreale, Solidago multiradiata* var. *scopulorum, Antennaria philonipha, A. stolonifera, Achillea nigrescens, Petasites frigidus,* and *Hieracium gracile.*

The lower slopes east of the road up to an elevation of about 800 feet above the road are formed by concentric morainic ridges covered by a mixed forest of alpine fir (*Abies lasiocarpa*), white spruce (*Picea glauca* var. *albertiana*), and scattered lodgepole pine (*Pinus contorta* var. *latifolia*). In protected places the first two grow to a fair size, but in most places they form a dense, stunted scrub through which run paths of snowslides. Near timber-line, alpine fir dominates as a low, almost impenetrable scrub which is severely depressed by snow pressure. Of the few species of vascular plants that grow in this scrub, *Betula glandulosa, Arnica cordifolia,* and *Cassiope tetragona* ssp. *saximontana* are the most common.

On the south- and west-facing slopes, near or slightly below timber-line, rich alpine meadows or herbmats present a rich assemblage of species. These meadows are treeless because of snowslides and are watered throughout the summer from snow accumulated in gullies and ravines of the upper slopes. The following species were noted here: *Botrychium boreale* ssp. *obtusilobum, Equisetum arvense, E. sylvaticum* var. *pauciramosum, Lycopodium alpinum, L. annotinum, L. complanatum* var. *canadense, Calamagrostis canadensis* var. *Langsdorffii, C. lapponica* var. *nearctica, Festuca altaica, Carex atrosquama, C. Lachenalii, C. podocarpa, C. pyrenaica, Juncus Drummondii, Luzula arcuata, L. parviflora, Streptopus amplexifolius* var. *denticulatus, Veratrum Eschscholtzii, Salix pseudopolaris, Polygonum viviparum, Oxyria digyna, Delphinium glaucum, Anemone narcissiflora, A. Richardsonii, Ranunculus Eschscholtzii, R. nivalis, R. pygmaeus, Cardamine bellidifolia, Saxifraga punctata* ssp. *insularis, Luetkea pectinata, Sanguisorba sitchensis, Potentilla diversifolia* var. *genuina, Sibbaldia procumbens, Viola* *renifolia* var. *Brainerdii*, *Epilobium Hornemannii*, *Pyrola secunda* var. *obtusata*, *Cassiope tetragona* ssp. *saximontana*, *Phyllcdoce empetriformis*, *Dodecatheon frigidum*, *Gentiana glauca*, *Polemonium acutiflorum*, *Mertensia paniculata* var. *alaskana*, *Pedicularis arctica*, *Castilleja unalaschcensis*, *Veronica alpina* var. *unalaschcensis*, *Valeriana sitchensis*, *Artemisia arctica*, *Antennaria alborosea*, *A. philonipha*, and *Agoseris aurantiaca*.

The summit of the mountain east of the pass (5,500 feet) is a rounded granite dome with numerous frost-heaved ledges and erratic boulders. Level ground between the rock outcrops is everywhere covered by alpine heath.

Primary spp.: *Cetraria nivalis*, *Cladonia rangiferina*, *Alectoria ochroleuca*, *Salix glauca* var. *acutifolia*, *S. pulchra*, *S. reticulata*, *Betula glandulosa*, *Saxifraga tricuspidata*, *Dryas integrifolia*, *Empetrum nigrum*, *Ledum decumbens*, *Vaccinium uliginosum*, and *V. Vitis-Idaea* var. *minus*.

Secondary spp.: *Stereocaulon paschale*, *Dactylina arctica*, *Lycopodium Selago*, *Abies lasiocarpa* (prostrate), *Festuca altaica*, *F. brachyphylla*, *Hierochloe alpina*, *Poa arctica*, *Trisetum spicatum*, *Kobresia Bellardii*, *Carex microchaeta*, *C. rupestris*, *C. supina* var. *spaniocarpa*, *Luzula arcuata*, *L. confusa*, *L. spicata*, *Salix arctica*, *Arenaria verna* var. *pubescens*, *Silene acaulis* var. *subacaulescens*, *Stellaria longipes* var., *Aconitum delphinifolium*, *Anemone narcissiflora*, *Cardamine bellidifolia*, *Potentilla diversifolia* var. *glaucophylla*, *P. Ledebouriana*, *P. villosa*, *Lupinus arcticus*, *Pyrola grandiflora*, *Arctostaphylos alpina*, *Gentiana glauca*, *Polemonium acutiflorum*, *Pedicularis arctica*, *P. capitata*, *P. labradorica*, *Campanula lasiocarpa*, *Antennaria Ekmaniana*, *A. compacta*, *A. elegans*, *A. monocephala*, *A. subcanescens*, *Artemisia arctica*, *Arnica alpina* ssp. *angustifolia*, *A. louiseana* ssp. *frigida*, *Senecio yukonensis*, and *Taraxacum alaskanum*.

PLANT COMMUNITIES OF THE NISUTLIN RIVER

Beyond Teslin-Nisutlin Pass the road descends into the broad valley of Nisutlin River where it follows a series of forested benches of boulder clay several hundred feet above the present level of the river. The general elevation here is between 2,500 and 3,000 feet and the forest is mixed white spruce, lodgepole pine, and aspen (1). Where the drainage is poor, a wet lodgepole pine muskeg type was noted which was seen nowhere else along Canol Road. A most interesting and varied flora was found on flood-plains at river level below the last bench.

Primary spp.: *Equisetum arvense*, *E. variegatum*, *Populus tacamahacca*, *Salix longistylis*, *S. Barclayi*, *Alnus incana*, *Hedysarum alpinum* var. *americanum*, *Shepherdia canadensis*, and *Aster sibiricus*.

Secondary spp.: *Equisetum scirpoides*, *E. sylvaticum* var. *pauciramosum*, *Selaginella selaginoides*, *Agrostis scabra*, *Agropyron subsecundum*, *A. trachycaulum*, *A. violaceum*, *Arctagrostis arundinacea*, *Calamagrostis inexpansa*, *C. lapponica* var. *nearctica*, *C. neglecta*, *C. purpurascens*, *Deschampsia caespitosa*, *Festuca altaica*, *F. rubra*, *Hierochloe odorata*, *Poa alpina*, *P. palustris*, *Trisetum spicatum*, *Eriophorum brachyantherum*, *Carex atrosquama*, *C. capillaris*, *C. concinna*, *C. diandra*, *C. Garberi* var. *bifaria*, *C. loliacea*, *C. media*, *Juncus balticus* var. *alaskanus*, *J. castaneus*, *Smilacina stellata*, *Zygadenus elegans*, *Allium Schoenoprasum*, *Listera borealis*, *Spiranthes*

Romanzoffiana, Cypripedium passerinum, Habenaria hyperborea, Corallorrhiza trifida, Salix arbusculoides, S. glauca var. *perstipula, S. lasiandra* var. *lancifolia, S. myrtillifolia, S. planifolia, S. Richardsonii, S. Scouleriana, Betula glandulosa, B. occidentalis, Alnus crispa, Polygonum viviparum, Rumex occidentalis, Arenaria uliginosa, Stellaria calycantha, St. crassifolia, Delphinium glaucum, Anemone multifida, A. parviflora, Corydalis sempervirens, Arabis divaricarpa, Erysimum cheiranthoides, Parnassia Kotzebuei, P. palustris* var. *neogaea, Potentilla fruticosa, Fragaria glauca, Rosa acicularis, Sanguisorba sitchensis, Amelanchier alnifolia, Lupinus arcticus, Oxytropis foliolosa, Astragalus eucosmus, Viola renifolia* var. *Brainerdii, Epilobium angustifolium, E. davuricum, E. glandulosum* var. *perplexans, E. latifolium, Cornus canadensis, Pyrola asarifolia* var. *incarnata, P. secunda, Arctostaphylos rubra, A. Uva-ursi, Ledum groenlandicum, Primula egaliksensis, P. stricta, Gentiana Amarella, G. propinqua, Polemonium acutiflorum, Phacelia Franklinii, Mertensia paniculata, Pedicularis labradorica, Penstemon procerus, Euphrasia disjuncta, Veronica alpina* var. *unalaschcensis, V. americana, Linnaea borealis* var. *americana, Galium boreale, Valeriana septentrionalis, Solidago decumbens* var. *oreophila, S. multiradiata* var. *scopulorum, Erigeron elatus, Antennaria alborosea, A. elegans, A. leuchippi, A. nitida, A. rosea, A. pulcherrima, Achillea nigrescens, Artemisia Tilesii* var. *elatior, Petasites palmatus, P. sagittatus, P. vitifolius, Arnica Chamissonis, Senecio indecorus, Circium foliosum, Crepis elegans,* and *Hieracium gracile.*

White spruce (*Picea glauca* var. *Porsildii*) is actively invading the higher parts of flood-plains which are no longer subject to floods during spring and early summer. Here are found open, pre-climax spruce forests in which the presence of numerous river-bank and meadow species testify to the youthfulness of this forest. The following is a typical composition of such pre-climax flood-plain forest in the Nisutlin River valley:

Primary spp.: *Equisetum scirpoides, Picea glauca* var. *Porsildii, Salix myrtillifolia, Hedysarum alpinum* var. *americanum, Mertensia paniculata,* and *Linnaea borealis* var. *americana.*

Secondary spp.: *Equisetum pratense, Festuca altaica, Trisetum spicatum, Carex atratiformis, C. atrosquama, C. bonanzensis, C. capillaris, C. capitata, C. disperma, C. leptalea, C. macloviana, C. media, C. praticola, C. physocarpa, Eriophorum brachantherum, Zygadenus elegans, Habenaria obtusata, Salix arbusculoides, Geocaulon lividum, Stellaria calycantha, Delphinium glaucum, Mitella nuda, Ribes hudsonianum, Fragaria glauca, Potentilla fruticosa, Rosa acicularis, Rubus acaulis, R. arcticus, Empetrum nigrum, Shepherdia canadensis, Moneses uniflora, Pyrola asarifolia* var. *incarnata, P. minor, P. secunda* var. *obtusata, P. virens, Ledum groenlandicum, Vaccinium caespitosum, V. uliginosum, V. Vitis-Idaea* var. *minus, Gentiana propinqua, Pedicularis labradorica, Galium boreale, Erigeron elatus, E. angulosus* var. *kamtchaticus, Achillea nigrescens, Senecio lugens, Solidago decumbens* var. *oreophila,* and *Taraxacum dumetorum.*

At the foot of the steep escarpment, which flanks the flood-plain opposite Mile 39-42, on a flat talus formed by large-scale landslides of boulder clay, occurred a type of rich poplar-spruce forest which, although restricted to limited areas, was noted elsewhere in a number of places in the southern half of Canol Road. Peculiar to this forest is deep, black leaf-mould with an exceptionally rich fauna of soil micro-organisms, as well as a small assemblage of plants of which some were not noted elsewhere along Canol Road.

Primary spp.: *Equisetum pratense, Populus tacamahacca, Salix Bebbiana* (forming trees 25 feet high and 8 inches in diameter), *S. glauca, Corydalis aurea, Aquilegia brevistyla, Actaea rubra, Ribes hudsonianum, R. lacustre, R. oxyacanthoides, Rosa acicularis, Shepherdia canadensis, Epilobium angustifolium, Moneses uniflora, Phacelia Franklinii, Mertensia paniculata*, and *Viburnum edule.*

In the deep, rich leaf-mould grew the very rare *Adoxa Moschatellina.*

At the foot of the steep river terrace east of Nisutlin River a series of ponds and extensive swamps occupy former river channels and ox-bows. On the springy borders of ponds grew: *Carex aquatilis, C. diandra, C. rhynchophysa, C. rostrata, Ranunculus hyperboreus, Rorippa islandica* var. *microcarpa, Potentilla palustris, Rubus Chamaemorus, Epilobium palustre,* and *Oxycoccus microcarpus.*

In the ponds were noted: *Chara* sp., *Sparganium angustifolium, Potamogeton alpinus* ssp. *tenuifolius, P. pectinatus, P. Richardsonii, P. vaginatus, Hippuris vulgaris, Nuphar polysepalum,* and *Utricularia vulgaris* var. *americana.*

On the well-drained soils of the upper benches of Nisutlin River valley, as well as on the divide into Quiet Lake Basin and in the lower part of the Rose River valley, the dominant forest type is lodgepole pine - white spruce - aspen (1). The following list is representative of the species which form the undergrowth in this forest on the lower east slope of Rose River valley near Mile 77.

Primary spp.: *Equisetum sylvaticum* var. *pauciramosum, Pinus contorta* var. *latifolia, Picea glauca* var. *Porsildii, Populus tremuloides, Salix arbusculoides, S. Barclayi,* and *S. Scouleriana.*

Secondary spp.: *Equisetum scirpoides, Lycopodium annotinum* var. *pungens, L. complanatum* var. *canadense, Picea mariana, Danthonia intermedia, Festuca altaica, F. saximontana, Poa glauca, Trisetum spicatum* var. *molle, Carex atratiformis, C. atrosquama, C. capitata, C. membranacea, C. media, C. macloviana, C. physocarpa, Luzula parviflora, Salix Richardsonii, Cerastium Beeringianum, Delphinium glaucum, Aconitum delphinifolium, Arabis Drummondii, Descurainia Richardsonii, Erysimum cheiranthoides, Mitella nuda, Ribes glandulosum, R. hudsonianum, R. lacustre, Rubus arcticus, Rosa acicularis, Geum macrophyllum* var. *perincisum, Oxytropis foliolosa, Shepherdia canadensis, Pyrola minor, Vaccinium caespitosum, Valerinia septentrionalis, Arnica Chamissonis, A. cordifolia* ssp. *genuina, Erigeron elatus, Antennaria alborosea, A. rosea, Artemisia Tilesii* var. *elatior, Senecio lugens, Petasites frigidus, P. palmatus, P. vitifolius, Circium foliosus,* and *Taraxacum dumetorum.*

PLANT COMMUNITIES OF THE UPPER ROSE RIVER

(Plates IA and IIB)

From July 9 to 23 the party was camped in upper Rose River valley just south of Rose-Lapie Divide at an elevation of 3,500 feet. The site was selected with a view to an easy access to high alpine ridges, cirques, and mountain valleys, and plateaux to the west. The east side of the narrow valley is flanked by a high granite ridge that rises to a steep, knife-edged crest from a magnificent talus slope formed by exfoliation. The mountains on both sides of the Rose River are granitic, whereas the floor of the valley consists of washed glacial till containing abundant calcareous drift. The upper Rose River on July 9 was a swift torrent, which could be forded only with difficulty; although fed from snowfields, the temperature of the water on July 9 was 52° F.

Flood-plains

The south end of Rose-Lapie Pass forms the northern boundary of the white spruce - lodgepole pine - aspen forest (1), which here occupies river terraces and the lower slopes, whereas flood-plains not subject to severe spring erosion are covered by subalpine meadows. For the purpose of comparison with the alpine flora of the adjacent mountains, the total flora of the glaciated floor of the valley is given:

Primary spp.: *Equisetum arvense, E. scirpoides, Picea glauca* var. *albertiana,, P. glauca* var. *Porsildii, Pinus contorta* var. *latifolia, Arctagrostis arundinacea, Poa pratensis, Populus tremuloides, Salix Barclayi, S. Bebbiana, S. glauca* var. *perstipula, S. myrtillifolia, Betula occidentalis, Aconitum delphinifolium, Rubus arcticus, Sanguisorba sitchensis, Astragalus umbellatus, Hedysarum alpinum* var. *americanum, Epilobium angustifolium, E. latifolium Cornus canadensis, Pyrola secunda, Ledum groenlandicum, Vaccinium Vitis-Idaea* var. *minus, Mertensia paniculata, Pedicularis sudetica, Galium boreale, Linnaea borealis* var. *americana, Valeriana sitchensis, Antennaria pulcherrima,* and *Achillea nigrescens.*

Secondary spp.: *Botrychium boreale* var. *obtusilobum, B. Lunaria* var. *minganense, Equisetum sylvaticum* var. *pauciramosum, E. variegatum, Selaginella selaginoides, Agropyron trachycaulum, Agrostis scabra, Bromus Pumpellianus* var. *arctica, Calamagrostis canadensis, Festuca altaica, F. rubra, F. saximontana, Hierochloe odorata, Poa alpina, P. arctica, P. Canbyi, P. paucispicula, Trisetum spicatum, Eriophorum russeolum* var. *leucothrix, E. Scheuchzeri, Eleocharis uniglumis, Carex aquatilis, C. aurea, C. capillaris, C. deflexa, C. leptalea, C. macloviana, C. media, C. membranacea, C. microglochin, C. physocarpa, Juncus albescens, J. balticus* var. *alaskanus, J. castaneus, J. Mertensianus, Luzula parviflora, Tofieldia pusilla, Habenaria hyperborea, Listera borealis, Populus tacamahacca, Salix longistylis, S. Barrattiana, S. Richardsonii, Betula glandulosa, Polygonum viviparum, Koenigia islandica, Oxyria digyna, Geocaulon lividum, Stellaria crassifolia, St. calycantha, Cerastium Beeringianum, Sagina intermedia, S. Linnaei, Arenaria dawsonensis, A. uliginosa, Anemone parviflora, Ranunculus hyperboreus, R. reptans, Thalictrum alpinum, Draba aurea, Dr. glabella, Dr. nivalis, Arabis Drummondii, A. lyrata* ssp. *kamchatica, Cardamine pratensis, C. umbellata, Rorippa islandica* var. *microcarpa, Rhodiola integrifolia, Chrysosplenium tetrandrum, Saxifraga cernua, S. Lyallii, S. tenuis, Parnassia fimbriata, P. Kotzebuei, P. palustris* var. *neogaea, Ribes grandulosum, Rubus acaulis, Fragaria glauca, Potentilla diversifolia* var. *glaucophylla, P. fruticosa, P. palustris, Rosa acicularis, Astragalus alpinus, Empetrum nigrum, Shepherdia canadensis, Viola renifolia* var. *Brainerdii, Epilobium palustre, Moneses uniflora, Pyrola asarifolia* var. *incarnata, P. minor, Arctostaphylos alpina, Vaccinium caespitosum, V. uliginosum,* *Primula egaliksensis, Gentiana propinqua, G. prostrata, Polemonium acutiflorum, Veronica alpina* var. *alterniflora, Castilleja unalaschcensis, Pedicularis labradorica, Viburnum edule, Solidago decumbens* var. *oreophila, S. multiradiata* var. *scopulorum, Aster sibiricus, Erigeron elatus, Antennaria alborosea, A. leuchippi, A. pedunculata, A. stolonifera, Artemisia Tilesii* var. *elatior, Petasites palmatus, P. sagittatus, Arnica cordifolia* ssp. *genuina, A. Chamissonis, A. latifolia, Senecio lugens, S. pauciflora, Hieracium gracile* var. *yukonensis,* and *Agoseris aurantiaca.*

A number of alpine species in the above list do not properly belong in the flora of the valley floor but are able to grow here on rocky ledges, gravel bars, and outwash fans where competition for space is slight due to the unstable nature of these habitats, and also because the huge masses of overflow ice that accumulate here during the winter remain until far into the summer, thereby shortening the growing season to equal that of high-alpine slopes and summits.

An illustration of this was found on a large outwash fan situated a short distance below the camp. This fan had been formed by a stream that rises in a cirque 2,000 feet above the floor of the valley. The fan is rather steep with a gradient of about 10 degrees and is composed of strongly washed boulders and gravel from the mountain above and contains very little fine material near the surface. The stream erosion at the head of the fan has cut a deep gorge or ravine into the steep granite wall of the mountain. By the end of July the last ice had disappeared from the fan; the cirque above still contained a large mass of snow.

Erosion appears to have stopped almost entirely, and there is little evidence that the fan is being added to in late years. Former stream-beds are rapidly being covered by vegetation, and in those that carried water earlier in the season the vegetation shows scarcely any signs of water erosion. Pine and fir seedlings are actively invading the fan. On July 10 a small stream, which could easily be crossed on foot, reached the apex of the fan but almost immediately disappeared underground so that all stream-beds on the fan were then dry. Only one species, *Calamagrostis canadensis* var. *Langsdorffii,* formed extensive colonies. *Equisetum arvense, E. sylvaticum* var. *pauciramosum, Pinus contorta* var. *latifolia, Abies lasiocarpa* (seedlings), *Agrostis scabra, Festuca saximontana, Hierochloe alpina, Poa glauca, P. paucispicula, P. pratensis, Trisetum spicatum, Carex brunnescens, C. Peckii, C. podocarpa, C. pyrenaica, Luzula arcuata, L. parviflora, Salix longistylis, S. glauca, Alnus crispa, Oxyria digyna, Polygonum viviparum, Arenaria sajanensis, Silene acaulis* var. *subacaulescens, Stellaria calycantha* var. *isophylla, Aconitum delphinifolium, Ranunculus Eschscholtzii, Cardamine bellidifolia, Saxifraga punctata* ssp. *insularis, S. rivularis, S. tricuspidata, Ribes triste, Dryas Drummondii, Luetkea pectinata, Rubus strigosus, Sibbaldia procumbens, Epilobium angustifolium, E. lactiflorum, E. latifolium, Empetrum nigrum, Cornus canadensis, Pyrola minor, P. secunda* var. *obtusata, Ledum groenlandicum, Arctostaphylos Uva-Ursi* var. *adenocaulon, Vaccinium uliginosum, V. Vitis-Idaea* var. *minus, Mertensia paniculata, Pedicularis labradorica, Veronica alpina* var. *alterniflora, Polemonium acutiflorum, Linnaea borealis* var. *americana, Campanula lasiocarpa, Solidago multiradiata* var. *scopulorum,* *Erigeron jucundus, Antennaria alborosea, A. incarnata, A. pedunculata, A. stolonifera, Artemisia arctica, Arnica latifolia,* and *Hieracium gracile.*

Snowflushes

Along a turbulent stream fed by snow from a cirque on the north side of the mountain, the snow had disappeared only recently. In spring the stream overflows and rapidly cuts through the large masses of ice and snow that accumulate in winter. Residual ice and snow masses still lay against the steep slopes flanking the stream-bed.

The list of species given below is representative of such late alpine habitats, especially such that receive abundant moisture throughout the growing season. On July 15 only the earliest flowering species were in blossom.

Primary spp.: *Carex membranacea, Luzula parviflora, Salix pseudopolaris, Anemone parviflora, A. Richardsonii, Ranunculus Eschscholtzii, Saxifraga Lyallii,* and *Petasites frigidus.*

Secondary spp.: *Equisetum arvense, Arctagrostis latifolia, Hierochloe odorata, Poa alpina, P. paucispicula, Scirpus caespitosus, Eriophorum angustifolium, E. russeolum* var. *leucothrix, Carex Lachenalii, C. podocarpa, Juncus castaneus, Salix alaxensis, S. Bebbiana, S. glauca, S. pulchra, S. reticulata, Oxyria digyna, Cerastium Beeringianum, Claytonia sarmentosa, Ranunculus nivalis, Corydalis pauciflora, Draba longipes, Rhodiola integrifolia, Parnassia fimbriata, P. Kotzebuei, Ribes triste, Saxifraga adscendens, S. caespitosa, S. punctata* ssp. *insularis, S. rivularis, Chrysosplenium tetrandrum, Sanguisorba sitchensis, Viola renifolia* var. *Brainerdii, Dodecatheon frigidum, Arnica alpina* ssp. *angustifolia, Senecio triangularis,* and *Taraxacum alaskanum.*

Alpine Herbmats and "Flower Gardens"

Some of the richest assemblages of plants anywhere along Canol Road were found at elevations above 5,600 feet in alpine herbmats above timber-line on a south-facing, gentle slope, well watered from springs fed by melting snowbanks of the upper slope above. The slope evidently receives abundant snow-cover in winter and the habitát, accordingly, is somewhat later than the upper slopes. However, on July 15 a few of the earliest species were already past flowering, although the remainder were in full bloom. A thick mantle of well-weathered soil on July 15 was thawed to a depth of about 3 feet and probably contained no permanently frozen subsoil.

In an area measuring 25 paces square, no less than 63 species of vascular plants were noted as follows: *Botrychium boreale* ssp. *obtusilobum, Lycopodium alpinum, L. Selago, Festuca altaica, Hierochloe alpina, Poa arctica, P. lanata, Trisetum spicatum* var. *molle, Carex microchaeta, C. podocarpa, Juncus biglumis, J. Drummondii, Luzula parviflora, Salix pseudopolaris, S. pulchra, S. reticulata, Betula glandulosa, Oxyria digyna, Polygonum viviparum, Stellaria longipes, Claytonia sarmentosa, Aconitum delphinifolium, Anemone narcissiflora, A. parviflora, A. Richardsonii, Delphinium glaucum, Ranunculus Eschscholtzii, Corydalis pauciflora, Parnassia fimbriata, P. Kotzebuei, Saxifraga Lyallii, S. tricuspidata,* *Rhodiola integrifolia, Dryas punctata, Empetrum nigrum, Epilobium angustifolium, E. Hornemannii, E. lactiflorum, E. latifolium, Pyrola minor, Cassiope tetragona, Phyllodoce empetriformis, Vaccinium Vitis-Idaea* var. *minus, Dodecatheon frigidum, Gentiana glauca, G. propinqua, Mertensia paniculata, Myosotis alpestris* ssp. *asiatica, Pedicularis capitata, P. sudetica, Veronica alpina* var. *unalaschcensis, Campanula lasiocarpa, Valeriana sitchensis, Antennaria monocephala, A. philonipha, Artemisia arctica, Erigeron unalaschkensis, Arnica latifolia, A. mollis, Petasites frigidus, Senecio triangularis, Solidago multiradiata,* and *Taraxacum alaskanum.*

On similar but slightly more varied habitats, within a radius of a few hundred feet, 48 additional species were added to the list: *Equisetum arvense, E. pratense, E. scirpoides, Juniperus communis* var. *montana, Abies lasiocarpa* (low, prostrate scrub), *Pinus contorta* var. *latifolia* (three small, stunted trees), *Calamagrostis canadensis* var. *Langsdorffii, Phleum alpinum, Carex membranacea, Juncus Mertensianus, Zygadenus elegans, Streptopus amplexifolius* var. *denticulatus, Veratrum Eschscholtzii, Salix arbusculoides, S. arctica* x *crassijulis, S. Barrattiana, S. commutata, S. glauca, S. Richardsonii, Arenaria sajanensis, Ranunculus occidentalis* var. *brevistylis, Draba longipes, Cardamine umbellata, Leptarrhena pyrolifolia, Mitella pentandra, Saxifraga rivularis, Luetkea pectinata, Potentilla diversifolia* var. *genuina, P. diversifolia* var. *glaucophylla, P. fruticosa, Sibbaldia procumbens, Rubus acaulis, R. stellatus, Sanguisorba sitchensis, Viola renifolia* var. *Brainerdii, Epilobium anagallidifolium, E. lactiflorum, Heracleum lanatum, Pyrola grandiflora, P. secunda* var. *obtusata, Kalmia glauca* var. *microphylla, Ledum decumbens, Vaccinium caespitosum, V. uliginosum, Pedicularis labradorica, Antennaria pygmaea, A. stolonifera,* and *Hieracium gracile.*

Alpine Lichen Heaths

More or less level, gravelly benches (5,500 feet) receive an abundant snow-cover in winter and, therefore, are late habitats covered by lichen heath. The vegetation, which only partly covers the gravel, is composed of the following species:

Primary spp.: *Stereocaulon paschale, Luzula arcuata, Salix pseudopolaris* and *Cassiope tetragona* ssp. *saximontana.*

Secondary spp.: *Dactylina arctica, Hierochloe alpina, Poa arctica, Carex microchaeta, C. Lachenalii, Luzula confusa, Oxyria digyna, Silene acaulis* var. *subacaulescens, Stellaria longipes, Anemone narcissiflora, Saxifraga punctata* ssp. *insularis, Polemonium acutiflorum, Pedicularis capitata, Campanula lasiocarpa, Antennaria compacta, A. monocephala, Arnica Lessingii, Artemisia arctica, Petasites frigidus,* and *Senecio yukonensis.*

Similar slopes between 5,500 and 6,000 feet facing east and south receive still more snow, but owing to the more favourable exposure the snow does not stay as late as on north slopes. Vegetation completely covers the ground.

Primary spp.: *Polytrichum* sp., *Cladonia alpestris, Salix arctica, S. pulchra* (bushes 3 to 5 feet high, forming small thickets occupying slight depressions in the terrain), *S. reticulata, Betula glandulosa, Cassiope tetragona* ssp. *saximontana,* and *Artemisia arctica.*

Secondary spp.: *Stereocaulon paschale, Lycopodium alpinum, L. Selago, Pinus contorta* var. *latifolia* (isolated, severely stunted and depressed specimens that probably do not emerge above the snow in winter), *Festuca altaica, Trisetum spicatum* var. *molle, Carex microchaeta, Zygadenus elegans, Stellaria longipes, Anemone narcissiflora, Rhodiola integrifolia, Empetrum nigrum, Vaccinium Vitis-Idaea* var. *minus, Gentiana glauca, Dodecatheon frigidum, Pedicularis capitata, Campanula lasiocarpa, Antennaria monocephala,* and *Senecio yukonensis.*

Rocky Ledges and Cliffs

On rocky ledges and on fossil stone-creeps, which protrude as low ridges above the general slope, the paucity of species is due to the stony character of substratum rather than to altitude. At elevations of 6,000 feet the species most commonly noted were: *Gyrophora* sp., *Poa arctica, Trisetum spicatum* var. *molle, Carex membranacea, C. microchaeta, Salix pseudopolaris, S. reticulata, Oxyria digyna, Anemone narcissiflora, Sibbaldia procumbens, Dryas punctata, Cassiope tetragona* ssp. *saximontana, Arctostaphylos alpina, Vaccinium uliginosum, Pedicularis labradorica,* and *Artemisia arctica.*

At 6,500 feet, on dry, windswept lichen heath in the saddle between two peaks were noted:

Primary spp.: *Alectoria ochroleuca, Cetraria islandica* (both heavily grazed by caribou), *Luzula arcuata, L. confusa, Salix pseudopolaris, Artemisia arctica,* and *Senecio yukonensis.*

Secondary spp.: *Dactylina arctica, Lycopodium Selago, Hierochloe alpina, Poa arctica, Carex microchaeta, Oxyria digyna, Silene acaulis* var. *subacaulescens, Stellaria longipes, Cardamine bellidifolia, Saxifraga oppositifolia, S. punctata* ssp. *insularis, Potentilla emarginata, Cassiope tetragona* ssp. *saximontana, Pyrola grandiflora, Vaccinium Vitis-Idaea* var. *minus, Gentiana glauca, Antennaria monocephala,* and *Senecio Kjellmanii.*

A strongly weathered cone of granite rose about 200 feet above saddle and is the highest point on this mountain massive (6,780 feet). On patches of vegetation between fossil rock stripes and on the cliffs near the summit, the following 34 species were noted: *Lycopodium Selago, Festuca altaica, Poa arctica, P. paucispicula, Trisetum spicatum* var. *molle, Carex microchaeta, C. Lachenalii, Luzula arcuata, L. confusa, Salix glauca, Oxyria digyna, Arenaria sajanensis, Silene acaulis* var. *subacaulescens, Anemone narcissiflora, Ranunculus pygmaeus, Papaver radicatum* ssp. *occidentalis, Rhodiola integrifolia, Saxifraga caespitosa, S. oppositifolia, S. punctata* ssp. *insularis, S. rivularis, S. tricuspidata, Potentilla emarginata, Dryas punctata, Pyrola grandiflora, Vaccinium Vitis-Idaea* var. *minus, Gentiana glauca, Pedicularis capitata, Campanula lasiocarpa, Antennaria monocephala, Arnica Lessingii, Artemisia arctica, Petasites frigidus, Senecio atropurpureus* var. *Ulmeri,* and *Taraxacum alaskanum.*

On the east side of Rose Valley, steep rock screes rise against the base of the upper rock wall. Most of the scree is now almost completely covered by a thick, firm turf formed of grass roots and slightly decomposed humus. Along a brook, which follows a shallow ravine and is fed by a fast vanishing snowdrift near the summit, are dense thickets of *Alnus crispa, Salix Barclayi, S. longistylis,* and *S. arbusculoides.* On the steep grassy slope grow: *Calamagrostis canadensis* var. *Langsdorffii, Danthonia intermedia, Schizachne purpurascens, Carex macloviana, C. podocarpa, Aconitum delphinifolium, Artemisia arctica*, and *A. Tilesii* var. *elatior.*

Along the brook, among masses of 5-foot high *Heracleum lanatum*, grew *Phleum alpinum, Streptopus amplexifolius* var. *americanus, Delphinium glaucum, Aquilegia formosa*, and *Senecio triangularis* (Plate I B).

On rocky places in the scree grew several species of ferns: *Cryptogramma acrostichoides* var. *sitchense, Dryopteris fragrans* var. *remotiuscula*, and *Dr. Linnaeana.*

PLANT COMMUNITIES OF THE LAPIE RIVER AND THE PELLY VALLEY

Edaphic Discontinuity

A strongly marked floristic break occurs between the north end of Rose-Lapie Pass and Pelly Valley. Here, near Mile 110, is the contact between the largely acidic rocks of the Yukon group of the Precambrian series and the calcareous Palæozoic rocks that form the northern end of Pelly Mountains. Furthermore, as noted by Kindle (1946), "the mountain peaks nearer the Pelly, between miles 117 and 130, are in a drier belt and appear to have escaped glaciation."

From June 12 to July 7 the party was camped on lower Lapie River a short distance above the bridge near Mile 132. From here numerous collecting trips were made including several ascents of the mountains south and north of the camp. The floristic difference between the Precambrian and Palæozoic rocks is strongly emphasized by the following two lists:

(1) Species definitely recognized as oxylophytes or, that in southeastern Yukon either are restricted to Precambrian rocks or, at least, are very rare or of very local occurrence on the Palæozoic rocks of Pelly Mountains between Mile 110 and 140: *Woodsia alpina, W. glabella, W. ilvensis, Dryopteris austriaca, Dr. fragrans, Dr. Linnaeana, Dr. Phegopteris, Cryptogramma acrostichoides* var. *sitchense, Botrychium boreale* ssp. *obtusilobum, B. lanceolatum, Equisetum sylvaticum* var. *pauciramosum, Lycopodium alpinum, Abies lasiocarpa, Pinus contorta* var. *latifolia, Agrostis scabra, Danthonia intermedia, Phleum alpinum, Poa paucispicula, Schizachne purpurascens, Eriophorum Scheuchzeri, Scirpus caespitosus, Carex capitata, C. Lachenalii, C. macloviana, C. pyrenaica, Juncus Drummondii, Luzula arcuata, L. spicata, Veratrum Eschscholtzii, Streptopus amplexifolius, Ranunculus Eschscholtzii, R. pygmaeus, Thalictrum alpinum, Cardamine bellidifolia, Parnassia fimbriata, Luetkea pectinata, Fragaria glauca, Sibbaldia procumbens, Potentilla palustris, Astragalus umbellatus, Epilobium Hornemannii, Kalmia polifolia* var. *microphylla, Cassiope tetragona* ssp. *saximontana, Arctostaphylos alpina, Gentiana glauca, Campanula lasiocarpa*, and *Hieracium gracile.*

(2) Species clearly recognized as calciphiles or that in southeastern Yukon are restricted to, or at least are very rare or of very local occurrence outside calcareous Palæozoic rocks of Pelly Mountains between Mile 110 and 140: *Triglochin maritimum, T. palustre, Festuca rubra, Scirpus validus, Kobresia simpliciuscula, Carex filifolia, C. obtusata, C. vaginata, Smilacina stellata, Cypripedium passerinum, Goodyera repens* var. *ophioides, Orchis*

rotundifolia, Habenaria hyperborea, H. obtusata, Listera borealis, Polygonum Bistorta ssp. *plumosum, Cerastium Beeringianum, Melandrium Ostenfeldii, Anemone multifida, Pulsatilla ludoviciana, Ranunculus sceleratus* ssp. *multifidus, Lesquerella arctica* var. *Purshii, Draba oligosperma, Dr. praealta, Arabis hirsuta* ssp. *pycnocarpa, A. Holboellii* var. *retrofracta, Erysimum cheiranthoides, E. inconspicuum, Parrya nudicaulis, Saxifraga aizoides, S. reflexa, Ribes oxyacanthoides, Fragaria yukonensis, Potentilla yukonensis, Chamaerhodos erecta* ssp. *Nuttallii, Dryas Drummondii, Astragalus striatus, A. tenellus, A. Williamsii, Oxytropis foliolosa, O. glutinosa, O. gracilis, O. splendens, O. viscidula* ssp. *sulphurea, Hedysarum Mackenzii, Geranium Richardsonii, Linum Lewisii, Viola adunca, Shepherdia canadensis, Cornus stolonifera, Rhododendron lapponicum, Cassiope tetragona, Arctostaphylos rubra, Primula mistassinica, Androsace septentrionalis, Polemonium pulcherrimum, Phacelia Franklinii, Lappula Redowskii* var. *occidentalis, Penstemon Gormani, Pedicularis arctica, P. lanata, Boschniakia rossica, Solidago decumbens* var. *oreophila, Haplopappus MacLeanii, Aster alpinus* ssp. *Vierhapperi, Erigeron compositus, Artemisia alaskana, A. borealis, A. frigida, Arnica alpina* ssp. *angustifolia, Crepis nana,* and *C. elegans.*

Dry Alpine Slopes

From the floor of lower Lapie River valley (elevation 2,750 feet) continuous forest extends from 1,000 to 1,500 feet up the lower slopes of the mountains. The dominant forest tree is white spruce with scattered paper birch and black spruce (forest type 3); the latter grows chiefly on poorly drained soils.

The north end of Pelly Mountains terminates abruptly in Tintina or Pelly Valley, which is a great valley feature comparable with the Rocky Mountain Trench (Bostock, 1948). Flanking this trench Pelly Mountains extend as a continuous wall through which gaps have been cut by the Lapie and by other rivers entering from the south.

Several ascents of the mountains north and south of the camp resulted in a number of interesting collections of plants including some species that proved undescribed or endemic to the region. Of particular interest was the mountain south of the bridge. Its upper south and west slopes are treeless, though the more moist east and north slopes are timbered almost to the summit. The rock exposed in the south slope is a finely laminated and severely folded schist which is subject to rapid weathering. The slope rises steeply in a series of rocky terraces alternating with rock-plate screes only partly covered by vegetation. Mountain sheep are still fairly common here as shown by their deeply worn trails and by deposits of dung several inches deep on rocky ledges. Other herbivorous animals inhabiting these slopes are chipmunks (*Eutamias minimus caniceps*) and woodrats (*Neotoma cinerea saxamans*).

Halfway up the mountain the slopes are strikingly fluted by water-sculptured shallow ravines. Under present climatic conditions the ravines carry no water and a considerable thickness of wind-blown soil has accumulated in them, which now supports a low thicket of aspen with a dense undergrowth composed of the following species:

Primary spp.: *Juniperus communis* var. *montana, Zygadenus elegans, Populus tremuloides, Anemone multifida, Fragaria yukonensis, Shepherdia canadensis, Epilobium angustifolium, Arctostaphylos Uva-ursi, and Viburnum edule.*

Secondary spp.: *Calamagrostis purpurascens, Festuca altaica, F. saximontana, Carex concinna, C. praticola, C. Rossii, Smilacina stellata, Geocaulon lividum, Arenaria lateriflora, Pulsatilla ludoviciana, Arabis hirsuta* ssp. *pycnocarpa, Rosa acicularis, Rubus strigosus, Astragalus tenellus, Oxytropis splendens, O. viscidula* ssp. *sulphurea, Linum Lewisii, Androsace septentrionalis, Polemonium pulcherrimum, Penstemon procerus, Galium boreale, Linnaea borealis* var. *americana, Solidago decumbens* var. *oreophila,* and *Achillea nigrescens.*

The flora of the rock-plate screes is very uniform and for 2,000 feet does not change appreciably.

Primary spp.: *Calamagrostis purpurascens, Carex filifolia, Saxifraga tricuspidata, Potentilla nivea* ssp. *fallax, Haplopappus MacLeanii* and *Artemisia frigida.*

Secondary spp.: *Agropyron dasystachyum, Bromus Pumpellianus* var. *arctica, Poa glauca, Carex obtusata, C. Rossii, C. supina* ssp. *spaniocarpa, Arenaria verna* var. *pubescens, Melandrium Ostenfeldii, Stellaria longipes* var., *Pulsatilla ludoviciana, Anemone multifida, Arabis divaricarpa, Draba oligosperma, Lesquerella arctica* var. *Purshii, Chamaerhodos erecta* ssp. *Nuttallii, Potentilla furcata, P. Ledebouriana, P. pennsylvanica, Fragaria yukonensis, Rosa acicularis, Astragalus aboriginorum, A. tenellus, Oxytropis gracilis, O. viscidula* ssp. *sulphurea, Shepherdia canadensis, Cornus stolonifera, Androsace septentrionalis, Penstemon Gormani, P. procerus, Galium boreale, Achillea nigrescens, Antennaria nitida, Artemisia borealis, A. alaskana, A. dracunculoides, Aster alpinus* ssp. *Vierhapperi, Erigeron compositus,* and *Solidago decumbens* var. *oreophila.*

On the slightly more moist and not quite so steep upper slope, a few species occur which were not found on the slope below: *Draba aurea, Potentilla diversifolia* ssp. *glaucophylla, Hedysarum Mackenzii, Myosotis alpestris* ssp. *asiatica, Antennaria Laingii, A. nitida, Arnica alpina* ssp. *angustifolia, A. louiseana* ssp. *genuina, Solidago multiradiata,* and *Taraxacum pellianum.*

Moist Alpine Tundra

Several ascents of the mountain northeast of Lapie River (Plate IIA) disclosed a flora that contrasts strongly with that of the dry south-facing slopes and may be taken as characteristic of the moist forest and muskeg-covered mountain slopes. Above timber-line, which here was at 4,250 feet, we found a mossy alpine heath that extended almost unchanged to the summit, which is at 5,600 feet above sea-level or 2,850 feet above Lapie River.

Primary spp.: *Arctagrostis latifolia, Hierochloe alpina, Salix reticulata, Betula glandulosa, Polygonum Bistorta* ssp. *plumosum* (abundant only in spots), *Rhododendron lapponicum, Parrya nudicaulis, Lupinus arcticus, Cassiope tetragona, Arctostaphylos rubra, Ledum decumbens, Vaccinium uliginosum, V. Vitis-Idaea* var. *minus,* and *Petasites frigidus.*

Secondary spp.: *Carex microchaeta, C. vaginata, Luzula confusa, Oxyria digyna, Silene acaulis* var. *subacaulescens, Stellaria longipes* var., *Oxytropis* *glutinosa, Pyrola grandiflora, P. secunda* var. *obtusata, Pedicularis arctica, P. labradorica, Saussurea angustifolia,* and *Senecio atropurpureus.*

On rocky ridges in this alpine heath grew *Arenaria Rossii, Saxifraga tricuspidata, Oxytropis pygmaea, Arnica alpina* ssp. *angustifolia,* and *A. louiseana* ssp. *genuina.*

The south and west sides of the summit are formed by steep slopes of slide rock; a gentle, rocky slope faces north, and precipitous cliffs form the east slope. Within a radius of 100 feet of the semi-barren, rocky summit we found a surprisingly rich flora composed of the following species:

Primary spp.: *Salix reticulata, Saxifraga tricuspidata, Dryas integrifolia, Cassiope tetragona, Vaccinium uliginosum, V. Vitis-Idaea* var. *minus,* and *Artemisia frigida* (on slide rock only).

Secondary spp.: *Cystopteris fragilis, Equisetum scirpoides, Juniperus communis* var. *montana, Picea glauca* (solitary, stunted, and depressed trees), *Agropyron latiglume, Calamagrostis purpurascens, Festuca altaica, Poa arctica, P. glauca, Hierochloe alpina, Trisetum spicatum, Kobresia Bellardii, Carex capillaris, C. nardina, C. obtusata, C. scirpoidea, Zygadenus elegans, Salix arctica, S. glauca* var. *acutifolia, S. pseudopolaris, Betula glandulosa, Polygonum viviparum, Arenaria Rossii, A. verna* var. *pubescens, Cerastium Beeringianum, Melandrium affine, Silene acaulis* var. *subacaulescens, Stellaria longipes* var., *Aconitum delphinifolium, Anemone Drummondii, A. narcissiflora, A. parviflora, Pulsatilla ludoviciana, Draba cinerea, Dr. lactea, Dr. nivalis, Parrya nudicaulis, Saxifraga caespitosa, S. cernua, S. reflexa, Dryas octopetala, Potentilla fruticosa, P. nivea* ssp. *Hookeriana, P. Ledebouriana, Hedysarum alpinum* var. *americanum, Oxytropis glutinosa, O. pygmaea, O. viscidula* ssp. *sulphurea, Empetrum nigrum, Epilobium angustifolium, E. latifolium, Pyrola grandiflora, P. secunda* var. *obtusata, Ledum decumbens, Rhododendron lapponicum, Arctostaphylos rubra, Androsace septentrionalis, Gentiana propinqua, G. prostrata, Mertensia paniculata, Pedicularis capitata, P. labradorica, Antennaria Ekmaniana, A. monocephala, Arnica alpina* ssp. *angustifolia, A. Lessingii, A. louiseana* ssp. *genuina, Artemisia alaskana, A. arctica, Aster alpinus* ssp. *Vierhapperi, Crepis nana, Erigeron compositus, E. unalaschkensis, Solidago multiradiata, Senecio atropurpureus* var. *Ulmeri,* and *Taraxacum pellianum.*

Marly Lakes in Pelly Valley

Several shallow lakes and ponds occupy former river channels on river terraces between the Pelly and lower Lapie Rivers. In all these lakes the water is alkaline, and in the shallow parts a thick, white bottom deposit is formed by small, lacustrine shells and *Chara.* Below this layer is from 12 to 18 inches of black, stinking mud.

The vegetation in and near these lakes was far behind that of the adjacent country and on June 19 only a few species were in flower. Although the temperature of the water was 65°F., the aquatic plants had barely commenced growth. Along the edge of spruce woods facing the lake were noted:

Primary ssp.: *Picea glauca* var. *albertiana, Potentilla fruticosa, Shepherdia canadensis, Ledum groenlandicum, Arctostaphylos rubra,* and *A. Uva-Ursi.*

Secondary spp.: *Equisetum arvense, Deschampsia caespitosa, Festuca altaica, Carex concinna, Zygadenus elegans, Habenaria obtusata, Orchis rotundifolia, Listera borealis, Goodyera repens* var. *ophioides, Cypripedium passerinum, Geocaulon lividum, Pulsatilla ludoviciana, Rubus acaulis, Rosa acicularis, Lupinus arcticus, Hedysarum alpinum* var. *americanum, Epilobium angustifolium, Vaccinium Vitis-Idaea* var. *minus, Mertensia paniculata, Pedicularis labradorica, Linnaea borealis* var. *americana, Galium boreale,* and *Senecio lugens.*

In boggy depressions, between hummocks along the lake margin, grew:

Primary spp.: *Triglochin maritimum, Carex gynocrates, C. sychnocephala, Salix arbusculoides, Betula glandulosa* and *Potentilla fruticosa.*

Secondary spp.: *Equisetum variegatum, Triglochin palustre, Carex concinna, Eriophorum brachyantherum, Juncus filiformis, Tofieldia pusilla, Habenaria hyperborea, Salix myrtillifolia, Parnassia palustris* var. *neogaea, Potentilla norvegica, P. yukonensis, Rubus acaulis, Pyrola asarifolia* var. *incarnata, P. minor, P. secunda, Arctostaphylos rubra, Gentiana propinqua, Primula stricta,* and *Pedicularis sudetica.*

On the muddy bottom, in shallow parts of the lake, grew a broad belt of marsh and aquatic plants among which were recognized: *Chara* sp., *Potamogeton vaginatus, Carex aquatilis, C. rostrata, Scirpus validus, Myriophyllum exalbescens,* and *Utricularia vulgaris* var. *americana.*

PLANT COMMUNITIES OF THE MOUNT SHELDON AREA

Mount Sheldon (7,200 feet) and the slightly lower Mount Riddell, separated by a 6-mile-broad saddle (4,400 feet), form an isolated group on the west side of upper Ross Valley near the 3,950-foot-high divide which separates Ross Valley from that of the south branch of Macmillan River (Plates III and V A).

The Canol Road traverses the lower east slope of Mount Sheldon, not far from the west shore of Sheldon Lake (3,100 feet). The mountain is formed by a core of granite and baked sedimentary rocks (Kindle, 1946). The east, north, and west slopes are steep and precipitous with deeply eroded ravines above a steep talus of slide rock, now heavily forested, on the east and north slope to 4,500 feet, and on the south and west slope to an elevation of 5,500 feet. The only easy ascent is from the south where the mountain rises in a long spur ending in an S-shaped knife-edged crest which from the north and southwest has been almost gouged through by deep glacial cirques. The floor of these is at an elevation of about 5,000 feet, and behind the rim each contains one or several small lakes fed by large residual snowbanks resting on huge talus slopes which lean against the almost perpendicular back and side walls of the cirques.

There is abundant evidence that valley glaciers once pushed up against the north and east base of the mountain, and on the northeast slope Kindle observed perched boulders to an elevation of 4,600 feet; but the presence on Mount Sheldon of several endemic species of plants, besides a group of species, which in the flora of Yukon must be interpreted as an ancient floristic element, strongly favours the view that the present flora is a very old one, that the upper slopes of the mountain were never glaciated, and that probably even the lower slopes and the saddle were not overridden by valley glaciers of the last great advance of the ice.

The much larger and higher Itsi group (Plate V B), some 40 miles northeast of Mount Sheldon, to-day has a large central ice-field from which glacier tongues descend. Mr. Breitung, who on August 22 made a hurried visit to the northwest corner of the Itsi Mountains, reported that the flora above timber-line was very similar to that of Mount Sheldon.

Black Spruce Muskeg

Extensive wet black spruce muskeg forest (Plate VII B) occupies the sides of the broad Ross River valley and extends to the base of the lower slopes of Mount Sheldon. The dreary monotony of this muskeg forest is broken only by the broad flood-plain through which Ross River meanders, and by eskers and gravel terraces which invariably are covered by an open scrub of *Betula occidentalis* that gradually is being invaded by white spruce (*Picea glauca* var. *albertiana*).

The black spruce muskeg evidently is a climax formation developed on the permanently frozen boulder clay which mantles the sides of the valley. Keele (1910) reports that the snow in Ross Valley at the end of the winter is 5 feet deep. Drainage and run-off, naturally, is very poor and even in late summer water percolates through the base of sphagnum tussocks. The wet boulder clay thaws only to a depth of about 2 feet and when the muskeg surface is removed, at once commences to flow even on a moderate slope. As elsewhere, the number of species growing in the muskeg is not large.

Primary spp.: *Sphagnum* spp., *Cladonia sylvatica* var. *alpestris*, *Equisetum sylvaticum* var. *pauciramosum*, *Picea mariana*, *Calamagrostis canadensis* var. *Langsdorffii*, *Festuca altaica*, *Carex media*, *Betula glandulosa*, *Spiraea Beauverdiana*, *Rubus Chamaemorus*, *Potentilla fruticosa*, *Ledum groenlandicum*, *Vaccinium uliginosum*, and *V. Vitis-Idaea* var. *minus*.

Secondary spp.: *Lycopodium complanatum* var. *canadense*, *Equisetum arvense*, *Agrostis scabra*, *Eriophorum brachyantherum*, *Carex disperma*, *Salix glauca* var. *acutifolia*, *S. planifolia*, *Anemone Richardsonii*, *Ranunculus lapponicus*, *Empetrum nigrum*, *Oxycoccus microcarpus*, *Pedicularis labradorica*, *Pinguicula villosa* (rare), and *Petasites frigidus*.

Although seed production appears to be abundant and seedlings not uncommon, the principal means of reproduction in the black spruce is by layering. Growth is very slow as shown by a tree measuring 6·5 cm. in diameter that had 131 annual rings.

White Spruce Forest

On the lower slopes of Mount Sheldon, where the gradient is sufficiently steep to provide good drainage, the black spruce is replaced by an open forest of white spruce (*Picea glauca* var. *albertiana*).

As the ground becomes progressively drier toward the mountain, sphagnum is replaced by mesophytic forest mosses accompanied by *Equisetum pratense*, *E. sylvaticum* var. *pauciramosum*, *Cornus canadensis*, *Pyrola secunda*, and *Linnaea borealis* var. *americana*, and the dwarf shrubs of the muskeg are largely replaced by willow and alder.

At the very base of the mountain, on a talus of large rocks now partly covered by a thick mantle of fertile and well-watered soil, is a dense forest composed of white spruce (*Picea glauca* var. *Porsildii*), alpine fir (*Abies lasiocarpa*), balsam poplar (*Populus tacamahacca*), and paper birch (*Betula papyrifera* var. *neoalaskana*).

Among the trees are dense thickets composed largely of tall *Salix longistylis, S. Bebbiana,* and *Alnus incana,* with an even denser ground-cover of blue-joint grass (*Calamagrostis canadensis*) and horsetail (*Equisetum sylvaticum* var. *pauciramosum*).

Above the heavily forested base, the east slope of Mount Sheldon towers in a series of steep cliffs, buttresses, and bastion-like ramparts, 3,500 feet high, to a knife-edged crest. Depending on soil, moisture, and exposure, this slope provides a number of highly diversified plant habitats. All, however, may be brought into two main categories, namely dry rocky slopes and ledges, and moist ravines. In the latter, and where sufficient moisture and soil is present, the forest extends to 4,500 feet, whereas the dry slopes support only scrubby trees and bushes. The vertical distribution of plants is obscured by the diversity of habitats, and no clear-cut zones can be established. In the following lists the approximate upper limit to which each species was noted has been inserted in brackets. A large number of species obviously did not reach their absolute vertical limit on Mount Sheldon.

Moist and Somewhat Shaded Ravines

Primary spp.: *Equisetum arvense* (6,000 feet), *E. pratense* (3,500 feet), *E. sylvaticum* var. *pauciramosum* (4,000 feet), *Picea glauca* var. *Porsildii* (4,000 feet), *Abies lasiocarpa* (4,500 feet), *Arctagrostis arundinacea* (4,500 feet), *Calamagrostis canadensis* var. *Langsdorffii* (4,500 feet), *Carex podocarpa* (6,000 feet), *Salix Barclayi* (4,500 feet), *S. longistylis* (4,000 feet), *Alnus crispa* (4,500 feet), *Parnassia fimbriata* (5,600 feet), *Ribes triste* (4,000 feet), *Spiraea Beauverdiana* (5,600 feet), *Empetrum nigrum* (6,000 feet), *Epilobium angustifolium* (5,600 feet), *Artemisia arctica* (7,200 feet), and *A. Tilesii* var. *elatior* (4,500 feet).

Secondary spp.: *Cystopteris fragilis* (5,000 feet), *Cryptogramma acrostichoides* (5,000 feet), *Dryopteris austriaca* (5,000 feet), *Dr. Linnaeana* (4,500 feet), *Dr. Phegopteris* (very rare at 4,000 feet), *Lycopodium annotinum* (5,100 feet), *Picea glauca* var. *albertiana* (4,500 feet), *Agropyron trachycaulon* (4,000 feet), *Agrostis scabra* (4,500 feet), *Festuca altaica* (7,200 feet), *Phleum alpinum* (4,500 feet), *Poa alpigena* (4,500 feet), *P. alpina* (6,000 feet), *P. arctica* (7,200 feet), *P. paucispicula* (6,000 feet), *Trisetum spicatum* (5,600 feet), *Eriophorum russeolum* var. *leucothrix* (rare at 4,500 feet), *Carex atrosquama* (4,000 feet), *C. brunnescens* (4,500 feet), *C. Lachenalii* (4,500 feet), *C. media* (5,000 feet), *C. scirpoidea* (7,200 feet), *Juncus castaneus* (5,000 feet), *J. Drummondii* (5,000 feet), *Luzula parviflora* (4,000 feet), *Veratrum Eschscholtzii* (4,200 feet), *Streptopus amplexifolius* var. *denticulatus* (4,200 feet), *Listera cordata* (rare at 4,200 feet), *Salix arbusculoides* (4,000 feet), *S. glauca* var. *acutifolia* (4,000 feet), *S. Richardsonii* (5,600 feet), *Betula occidentalis* (3,500 feet), *B. papyrifera* var. *neoalaskana* (4,500 feet), *Oxyria digyna* (6,000 feet), *Polygonum alaskanum* (4,000 feet), *P. viviparum* (7,200 feet), *Aconitum delphinifolium* (4,500 feet), *Delphinium glaucum* (4,500 feet), *Anemone narcissiflora* (7,200 feet), *Ranunculus Eschscholtzii* (5,000 feet), *R. pygmaeus* (6,000 feet), *Corydalis sempervirens* (4,000 feet), *Barbarea orthoceras* (4,000 feet), *Cardamine umbellata* (5,000 feet), *Arabis lyrata* ssp. *kamchatica* (5,000 feet), *Rhodiola integrifolia* (7,200 feet), *Leptarrhena pyrolifolia* (rare at 5,000 feet), *Saxifraga punctata* ssp. *insularis* (6,000 feet), *S. rivularis* (6,000 feet), *Parnassia Kotzebuei* (5,600 feet), *P. palustris* var. *neogaea* (5,000 feet), *Ribes hudsonianus* (4,000 feet), *Sorbus scopulina* (4,500 feet), *Rubus alaskanus* (locally abundant, 4,500 feet), *R. stellatus* (rare, 5,000 feet), *Potentilla fruticosa* (5,000 feet), *P. diversifolia* var. *glaucophylla* (5,000 feet), *Sibbaldia procumbens* (5,000 feet), *Hedysarum alpinum* var. *americanum* (4,000 feet), *Epilobium Hornemannii* (5,000 feet), *E. latifolium* (6,000 feet), *Heracleum lanatum* (5,000 feet), *Pyrola minor* (5,600 feet), *P. secunda* (5,600 feet), *Dodecatheon frigidum* (5,600 feet), *Gentiana propinqua* (rare, 5,000 feet), *Polemonium acutiflorum* (5,500 feet), *Mertensia paniculata* (5,600 feet), *Veronica alpina* var. *alterniflora* (6,000 feet), *Pedicularis sudetica* (6,100 feet), *Valeriana sitchensis* (5,600 feet), *Adoxa Moschatellina* (very rare, 4,500 feet), *Viburnum edule* (4,000 feet), *Campanula lasiocarpa* (7,200 feet), *Agoseris aurantiaca* (5,000 feet), *Arnica cordifolia* (4,500 feet), *Artemisia arctica* (7,200 feet), *A. Tilesii* var. *elatior* and *Aster sibiricus* (6,000 feet), *Senecio lugens* (5,600 feet), *S. triangularis* (5,600 feet), and *Taraxacum alaskanum* (7,200 feet).

Dry Slopes and Ledges

As a number of species are equally well at home in moist and dry habitats, there is a certain amount of overlap between the preceding and the following list. A number of species that obviously were growing outside their natural habitat were included in the field lists but have been eliminated here.

Primary spp.: *Juncus communis* var. *montana* (4,500 feet), *Festuca altaica* (7,200 feet), *Poa glauca* (5,000 feet), *Carex scirpoidea* (7,200 feet), *Betula glandulosa* (6,000 feet), *Alnus crispa* (4,500 feet), *Arctostaphylos Uva-Ursi* (5,000 feet).

Secondary spp.: *Woodsia ilvensis* (4,000 feet), *Dryopteris fragrans* var. *remotiuscula* (5,000 feet), *Botrychium Lunaria* (7,200 feet), *Lycopodium clavatum* var. *monostachyon* (5,000 feet), *Agrostis borealis* (4,500 feet), *Danthonia intermedia* (4,000 feet), *Festuca brachyphylla* (7,200 feet), *F. saximontana* (4,000 feet), *Hierochloe alpina* (7,200 feet), *Trisetum spicatum* (7,200 feet), *Carex deflexa* (4,500 feet), *C. praticola* (4,500 feet), *Luzula confusa* (7,200 feet), *Zygadenus elegans* (4,500 feet,) *Populus tremuloides* (5,000 feet), *Salix alaxensis* (6,000 feet), *Arenaria sajanensis* (7,200 feet), *Silene acaulis* var. *subacaulescens* (7,200 feet), *Anemone narcissiflora* (7,200 feet), *A. parviflora* (7,200 feet), *Saxifraga tricuspidata* (7,200 feet), *Rosa acicularis* (5,000 feet), *Empetrum nigrum* (6,000 feet), *Cornus canadensis* (5,100 feet), *Pyrola asarifolia* var. *incarnata* (5,000 feet), *Vaccinium uliginosum* (6,100 feet), *V. Vitis-Idaea* var. *minus* (7,200 feet), *Pedicularis capitata* (7,200 feet), *Boschniakia rossica* (4,500 feet), *Galium boreale* (4,000 feet), *Linnaea borealis* var. *americana* (5,000 feet), *Achillea nigrescens* (5,000 feet), *Arnica Lessingii* (6,100 feet), and *A. Parryi* (5,000 feet).

Several of the species included in the two preceding lists appear to be equally well at home below as well as above timber-line, and a few even at the very summit. On the other hand, a small group of thirty-three truly arctic-alpine species were not seen below timber-line on the north and east slope: *Poa lanata* (6,000 feet), *Eriophorum Scheuchzeri* (5,000 feet, rare), *Carex membranacea* (5,000 feet, rare), *C. microchaeta* (7,200 feet), *Juncus biglumis* (6,000 feet, rare), *Luzula spicata* (7,200 feet), *Salix pseudopolaris* (7,200 feet), *Stellaria longipes* var. (7,200 feet, rare), *Cerastium Beeringianum* (4,500 feet), *Sagina Linnaei* (6,000 feet), *Melandrium affine* (6,000 feet), *M. apetalum* (7,200 feet), *Draba cinerea* (5,000 feet), *Dr. glabella* (6,000 feet), *Dr. lactea* (6,000 feet), *Dr. nivalis* (5,000 feet), *Saxifraga oppositifolia* (7,200 feet only), *Potentilla elegans* (6,500 feet), *P. emarginata* (7,200 feet), *P. Ledebouriana* (6,000 feet), *Dryas octopetala* (7,200 feet), *Astragalus alpinus* (5,000 feet), *A. umbellatus* (5,000 feet), *Oxytropis Maydelliana* (5,000 feet, rare), *O. pygmaeus* (5,000 feet, rare), *O. sheldonensis* (7,200 feet), *Epilobium anagallidifolium* (6,000 feet), *E. lactiflorum* (5,000 feet), *Arctostaphylos alpina* (6,100 feet), *Antennaria monocephala* (7,200 feet), *Arnica louiseana* (5,600 feet), *Erigeron eriocephalus* (7,200 feet only), and *Senecio atropurpureus* (5,000 feet).

Lack of suitable habitats rather than extreme elevation appeared to limit the 30 species that grew on the very steep ledges just below the 7,200-foot crest. Of these, only one species, *Saxifraga oppositifolia*, was not seen elsewhere on Mount Sheldon.

South and West Slopes

Whereas the steep granitic north and east slopes of Mount Sheldon are inhabited by an assemblage of plants that nearly all may be classed as oxylophytes, the flora of the more gently sloping south and west slopes has an element of pronounced calciphilous species owing to the presence here of calcareous, sedimentary rocks. Some species that belong in this group were noted in the boggy flat occupying the saddle between Mount Sheldon and Mount Riddell: *Lycopodium Selago* (4,500 feet), *Agropyron latiglume* (4,500 feet), *Arctagrostis latifolia* (4,000 feet), *Scirpus caespitosus* ssp. *austriacus* (4,400 feet), *Eriophorum brachyantherum* (4,400 feet), *Carex aquatilis* (4,400 feet), *C. canescens* (4,200 feet), *C. gynocrates* (4,400 feet), *C. lapponica* (4,400 feet), *C. leptalea* (4,400 feet), *C. limosa* (4,400 feet), *C. paupercula* (4,400 feet), *Tofieldia pusilla* (4,400 feet), *Spiranthes Romanzoffiana* (4,400 feet), *Salix commutata* (4,400 feet), *S. myrtillifolia* (4,400 feet), *Arenaria lateriflora* (4,200 feet), *Thalictrum sparsiflorum* (4,200 feet), *Potentilla palustris* (4,200 feet), *Kalmia polifolia* var. *microphylla* (4,400 feet), *Trientalis europaea* var. *arctica* (4,200 feet), and *Senecio pauciflorus* (4,200 feet).

Also, largely belonging in this group but inhabiting the mountain slope between the saddle and rocky ledges below the summit are the following species: *Botrychium lanceolatum* (4,200 feet, rare), *Equisetum scirpoides* (5,100 feet), *E. variegatum* (4,000 feet), *Vahlodea atropurpurea* ssp. *latifolia* (4,500 feet), *Eriophorum angustifolium* (5,600 feet), *Luzula arcuata* (6,100 feet), *Salix pulchra* (5,600 feet), *S. reticulata* (6,100 feet), *Cardamine bellidifolia* (6,100 feet), *Saxifraga Lyallii* (5,000 feet), *S. radiata* (5,000 feet), *Ribes glandulosum* (4,200 feet), *Luetkea pectinata* (6,000 feet, rare), *Rubus strigosus* (4,000 feet), *Lupinus arcticus* (5,000 feet), *Viola Selkirkii* (4,000 feet), *Moneses uniflora* (5,100 feet, rare), *Pyrola grandiflora* (6,000 feet, sterile, not found elsewhere on the mountain), *Ledum decumbens* (6,100 feet), *Phyllodoce empetriformis* (6,100 feet), *Cassiope* *tetragona* ssp. *saximontana* (6,100 feet), *Arctostaphylos rubra* (5,100 feet), *Gentiana glauca* (6,100 feet), *Myosotis alpestris* ssp. *asiatica* (6,100 feet), *Antennaria compacta* (5,600 feet), *A. elegans* (5,600 feet), *A. philonipha* (5,600 feet), *A. stolonifera* (5,600 feet), *Erigeron elatus* (4,200 feet), *E. angulosus* var. *kamtschaticus* (4,200 feet), *Hieracium gracile* (5,600 feet), *H. gracile* var. *yukonensis* (4,200 feet), *H. triste* (4,200 feet), *Solidago multiradiata* var. *scopulorum* (6,100 feet), and *Taraxacum dumetorum* (4,200 feet).

Subalpine Meadows or Prairies

Exceptionally rich subalpine meadows possessing a floristic element composed of species that in Yukon are peculiar to such grassland occur in a number of places along the Canol Road. Some of the best examples were found at an elevation of 3,500 feet on the northwest spur of Mount Sheldon, near Mile 222, and on river terraces of the south branch of Macmillan River. (Plates V B and VI A and B. *See* pages 18-20 for analyses of grassland soils.)

In the following list of species comprising the flora of the Mount Sheldon meadows, those preceded by an asterisk are peculiar to such habitats:

Primary spp.: *Calamagrostis canadensis, Festuca altaica, Rumex arcticus, Delphinium glaucum, *Ranunculus abortivus, *R. Macounii, *Thalictrum sparsiflorum, *Geum macrophyllum* var. *perincisum, Polemonium acutiflorum, Mertensia paniculata, Galium boreale, Achillea nigrescens, *Arnica Chamissonis, Artemisia Tilesii* var. *elatior, Senecio triangularis, Solidago decumbens* var. *oreophila.*

Secondary spp.: **Amanita phalloides* (only one specimen seen), *Agropyron latiglume, A. trachycaulum, Agrostis scabra, Arctagrostis arundinacea, Arctophila fulva, *Bromus Dudleyi, Calamagrostis lapponica* var. *nearctica, Danthonia intermedia, Phleum alpinum, Poa alpigena, *Schizachne purpurascens, Trisetum spicatum* var. *molle, Carex aenea, C. arcta, *C. atherodes, C. brunnescens, C. deflexa, C. macloviana, C. praticola, C. rostrata, Luzula parviflora, Salix planifolia, S. Barclayi, S. myrtillifolia, Betula glandulosa, Polygonum amphibium* ssp. *laevimarginatum, Arenaria lateriflora, *Stellaria crassifolia, *St. longifolia, Aconitum delphinifolium, Ranunculus reptans* var. *intermedia, *Arabis Drummondii, A. lyrata* ssp. *kamchatica, Rorippa islandica* var. *microcarpa, Cardamine pratensis, Barbarea orthoceras, *Draba nitida, Parnassia palustris* var. *neogaea, Potentilla fruticosa, Rosa acicularis, Rubus arcticus, Lupinus arcticus* (inside willow thickets only), *Astragalus alpinus, Epilobium angustifolium, E. palustre, *Viola epipsila* var. *repens, Cornus canadensis, Heracleum lanatum, *Gentiana Amarella, Veronica alpina* var. *alterniflora, *V. americana, *V. scutellata, Valeriana septentrionalis, *Agoseris aurantiaca, *Cirsium foliosum, *Hieracium gracile* var. *yukonensis, Senecio lugens, S. pauciflorus, *S. sheldonensis,* and *Taraxacum dumetorum.*

Salix planifolia, S. Barclayi, and *S. myrtillifolia* do not grow in the meadows proper but form a belt around the grassland, which they slowly invade. In this succession a rather narrow belt of *S. myrtillifolia* forms the vanguard and is followed by a much wider belt of 6 to 12 feet high *S. planifolia,* which again is succeeded by *S. Barclayi.*

Numerous pits dug in these meadows revealed that a distinct lateral zonation as well as other distributional variations in the floristic composition of the meadows are due to variations in the underlying soils. Thus, in the centre, and lowest, parts we usually found a considerable thickness of a rich, black and brown loam with pH values between 5·7 and 6·1. On these rich soils grew *Delphinium glaucum, Rumex arcticus, Arnica Chamissonis, Heracleum lanatum,* and others, not infrequently in pure or almost pure colonies. Near the edge and on higher parts of the meadows, on fine shaly gravel of lower pH values, grasses, notably *Festuca altaica,* dominated.

The floristic composition of the more extensive prairies found on the perfectly level river terraces of the south branch of Macmillan River is essentially the same as that of the Mount Sheldon meadows.

Lakes and Marshes

Sheldon, Field, and Lewis Lakes (3,000 feet), through which Ross River flows, occupy a shallow depression in Ross Valley east of Mount Sheldon. All are shallow and muddy and are rapidly being filled by the sediment-loaded river. On and around these lakes, extensive marshes, sloughs, shallow shelving beaches, and mud flats afford abundant habitats for aquatic and marsh plants.

Wet lake shores and marshes: *Equisetum limosum, Alopecurus aequalis, Arctagrostis arundinacea, Arctophila fulva, Calamagrostis lapponica* var. *nearctica, Deschampsia caespitosa, Glyceria pulchella, Eriophorum angustifolium, Carex aquatilis, C. arcta, C. canescens, C. praticola, C. physocarpa, C. rostrata, Juncus castaneus, J. filiformis, Salix arbusculoides, Alnus incana, Rumex arcticus, R. utahensis, Polygonum caurianum, Stellaria calycantha, Ranunculus Gmelini, R. reptans, Rorippa islandica* var. *microcarpa, Barbarea orthoceras, Cardamine pennsylvanica, Arabis lyrata* ssp. *kamchatica, Parnassia palustris* var. *neogaea, Potentilla palustris, P. norvegica, Epilobium palustre, Cicuta mackenzieana, Chamaedaphne calyculata, Artemisia Tilesii* var. *elatior,* and *Petasites sagittatus.*

In sloughs and shallow water: *Isoëtes Braunii, Sparganium angustifolium, Potamogeton alpinus* ssp. *tenuifolius, P. filiformis* var. *borealis, P. gramineus, P. panormitanus* var. *major, P. perfoliatus, P. Porsildiorum, P. Richardsonii, P. vaginatus, Eleocharis acicularis, Subularia aquatica, Callitriche autumnalis, C. verna, Hippuris vulgaris, Myriophyllum exalbescens, Limosella aquatica,* and *Utricularia vulgaris* var. *americana.*

John Lake, east of Mile 213, on a small tributary to the Ross, is much smaller but not muddy like the other lakes, and only 5 to 6 feet deep. Here, besides most of the aquatic species already noted, we found *Nuphar polysepalum,* which completely covered the surface of the lake, and *Lemna trisulca.* (Plate VII A).

VEGETATION OF THE MACMILLAN PASS AREA

No floristic break occurred north of Mount Sheldon until we reached Macmillan Pass. On a shaly mountain west of Mile 268 the timber-line extended only about 500 feet above the road-level. On the treeless slopes that extended to the summit at 6,500 feet elevation, the alpine plant communities were of similar composition as those noted on Mount Sheldon and on Rose River. The difference in latitude, and perhaps also a heavier snowfall in winter, accounted for the noticeably late development of many species in the alpine herbmats and meadows that here, towards the end of August, were still in flower. Near the edge of extensive snowfields formed by avalanches, a number of species, including such characteristic snowpatch species as *Senecio triangularis, Valeriana sitchensis, Veratrum Eschscholtzii,* and others, had barely commenced growth.

In sheltered depressions on the otherwise barren and shaly summit were noted the following: *Alectoria ochroleuca* and a few other lichens, *Calamagrostis lapponica* var. *nearctica, Hierochloë alpina, Poa arctica, Carex pyrenaica, Luzula arcuata, Salix arctica, S. pulchra, Cassiope tetragona, Vaccinium Vitis-Idaea* var. *minus, Gentiana glauca, Campanula lasiocarpa, Antennaria monocephala, Artemisia arctica,* and *Senecio yukonensis.*

Although the elevation of Mackenzie-Yukon Divide is close to 5,000 feet above sea-level, we found a surprisingly rich flora composed of arctic and alpine species. Here occurred the first major floristic break, for a number of calciphilous species that were either absent along the Yukon sector of Canol Road or limited to the calcareous rocks of the north end of Pelly Mountains were common in the east end of the pass, but absent, or at least very rare, west of the boundary. Some species that belong in this category are: *Elymus innovatus, Alopecurus alpinus* (elsewhere known only from near sea-level), *Carex misandra, Kobresia simpliciuscula, Tofieldia coccinea, Arenaria arctica, Parrya nudicaulis, Saxifraga aizoides, Chrysanthemum integrifolium, Androsace Chamaejasme* var. *arctica,* and *Saussurea integrifolia.*

Conversely, a number of species that are common in southeastern Yukon but not heretofore known to occur in Mackenzie district had penetrated a short distance east of the boundary. Such species are: *Abies lasiocarpa, Carex pyrenaica, Juncus Drummondii, Veratrum Eschscholtzii, Parnassia fimbriata, Phyllodoce empetriformis, Valeriana sitchensis,* and *Senecio triangularis.*

The following list includes most of the species noted on the arctic-alpine tundra in the pass.

Grassy slopes interspersed with willow and ground birch thickets:

Primary spp.: *Arctagrostis arundinacea, Festuca altaica, Calamagrostis canadensis* var. *Langsdorffii, Carex podocarpa, Salix pulchra, Betula glandulosa, Spiraea Beauverdiana, Sibbaldia procumbens, Epilobium angustifolium, Vaccinium uliginosum, V. Vitis-Idaea* var. *minus, Senecio triangularis, Artemisia arctica,* and *Petasites frigidus.*

Secondary spp.: *Botrychium Lunaria, Selaginella selaginoides, Lycopodium alpinum, Equisetum arvense, E. pratense, E. scirpoides, Juniperus communis* var. *montana, Vahlodea atropurpurea* var. *latifolia, Colpodium Wrightii, Deschampsia brevifolia, Phleum alpinum, Trisetum spicatum, Poa alpina, P. alpigena, P. arctica, Agropyron angustiglume, Carex atrosquama, C. canescens, C. Lachenalii, C. macloviana, C. media, C. membranacea, C. stans, Luzula parviflora, L. Wahlenbergii, Juncus Drummondii, Zygadenus elegans, Veratrum Eschscholtzii* (rare), *Salix glauca* var. *acutifolia, S. pulchra, Polygonum viviparum, Rumex arcticus, Arenaria sajanensis, Stellaria calycantha, St. longipes, Ranunculus Eschscholtzii, R. nivalis, Delphinium* *glaucum, Aconitum delphinifolium, Anemone narcissiflora, A. parviflora, Saxifraga punctata* ssp. *insularis, Rubus arcticus, R. alaskensis* (sterile), *Potentilla fruticosa, P. diversifolia* var. *glaucophylla, Geum macrophyllum* var. *perincisum, Epilobium anagallidifolium, E. lactiflorum, Cornus canadensis, Empetrum nigrum, Viola renifolia* var. *Brainerdii, Heracleum lanatum, Pyrola asarifolia* var. *incarnata, P. minor, P. secunda, Loiseleuria procumbens, Arctostaphylos alpina, A. rubra, Phyllodoce empetriformis, Cassiope tetragona, Polemonium acutiflorum, Gentiana glauca, Veronica alpina* var. *unalaschcensis, Myosotis alpestris* ssp. *asiatica, Valeriana sitchensis, Mertensia paniculata, Achillea nigrescens, Antennaria philonipha, A. Ekmaniana, A. stolonifera, Arnica latifolia, A. Lessingii, Artemisia Tilesii* var. *elatior, Hieracium triste, Petasites sagittatus, Senecio lugens, S. Kjellmanii,* and *Solidago multiradiata.*

In wet bogs grew: *Arctophila fulva* (sterile), *Carex physocarpa, C. stans, Eriophorum angustifolium, E. Scheuchzeri, Anemone Richardsonii, Cardamine pratensis, Potentilla palustris, Kalmia polifolia* var. *microphylla,* and *Ledum groenlandicum.*

On gravel bars in flood-plains we found: *Equisetum scirpoides, Deschampsia brevifolia, Alopecurus alpinus, Poa paucispicula, Carex capillaris, C. pyrenaica, Luzula confusa, Salix alaxensis, S. Barclayi, S. Barrattiana, S. reticulata, S. Richardsonii, Polygonum alaskanum, Ranunculus pygmaeus, Arabis lyrata* ssp. *kamchatica, Parnassia fimbriata, P. Kotzebuei, Rhodiola integrifolia, Chrysosplenium tetrandrum, Saxifraga Lyallii, S. rivularis, S. radiata, Dryas integrifolia, Gentiana arctophila,* and *Aster sibiricus.*

Gravelly river terraces and eskers occupy much of the pass and support rather open thickets of from 3- to 5-foot-high *Salix pulchra* and *Betula glandulosa.* The undergrowth is made up of about a dozen species, of which the following are the most important: *Cladonia sylvatica, Calamagrostis canadensis* var. *Langsdorffii, Festuca altaica, Carex podocarpa, Luzula parviflora, Rubus arcticus, Sibbaldia procumbens, Gentiana glauca,* and *Artemisia arctica.*

THE FLORA OF YUKON

PHYTOGEOGRAPHIC DIVISIONS

Thus far the only attempt to divide Yukon phytogeographically was made by Hultén in his Flora of Alaska and Yukon (1941) where he proposed an "Arctic Coast District," a "Central," and an "Upper Yukon District." The last two he separated by a line which, from the Mackenzie-Yukon Divide, roughly follows the Stewart–Macmillan River watershed crossing the Yukon between the confluences of Stewart and White Rivers. Hultén's scheme, obviously, is a makeshift, devised merely to obtain continuity with the floristic provinces that he outlined for Alaska, for even now too little is known of the flora of Yukon to permit a proper phytogeographical division into natural floristic provinces. To do this we shall have to know more about the floras inhabiting the Selwyn and Ogilvie Ranges and especially about the botanically completely unknown parts of northern Yukon.

Hultén's "Upper Yukon" is the most unnatural of his three floristic provinces and, in the light of increased knowledge, should be divided into at least four provinces, whereas his two northern phytogeographic provinces perhaps ought to be expanded into three. By this scheme Yukon may be divided into seven phytogeographical provinces which are tentatively defined as follows:

(1) Southeastern Yukon is connected through Cassiar Mountains to the Canadian Cordillera and it is only natural that its flora should contain a larger element of Cordilleran species than do other phytogeographic provinces. Thus the large number of species that in the last few years have been added to the known flora of Yukon nearly all belong in this group, which in southeastern Yukon roughly approximates one hundred species or one seventh of its entire flora; many of them, including most of the following clear-cut Cordilleran plants, in Yukon thus far have been found nowhere else: *Abies lasiocarpa*, *Pinus contorta* var. *latifolia*, *Carex filifolia*, *C. Franklinii*, *C. petricosa*, *C. Rossii*, *C. stenochlaena*, *Juncus Drummondii*, *Salix commutata*, *Commandra pallida*, *Aquilegia formosa*, *Sedum lanceolatum* ssp. *typicum*, *Parnassia fimbriata*, *Chamaerhodos erecta* ssp. *Nuttallii*, *Phyllodoce empetriformis*, *Cassiope tetragona* ssp. *saximontana*, *Arnica cordifolia*, *A. latifolia*, *A. mollis*, *A. Parryi*, and *Senecio triangularis*.

The closer relationship between the flora of southeastern Yukon and that of the Canadian Cordillera, as compared with that of western Alaska, is particularly well illustrated by the genus *Antennaria* in which only a few, and presumably very old, species occur in the Bering Sea area, whereas in recent years, exploration in southeastern Yukon has revealed a complex flora of *Antennaria* which is much more closely related to species of the Cordillera than to those of western Alaska.

In view of its glacial history it is natural, too, that the flora of southeastern Yukon should have only half as large an element of Beringian radiants as do the northern and central phytogeographical provinces. Plants of endemic or limited range follow a similar pattern, for, of the one hundred species, approximately, belonging in this group, only forty thus far have been recorded in southeastern Yukon.

As conceived by the writer the delimitation of southeastern Yukon as a natural floristic province conforms fairly well to the known Yukon range of alpine fir (*Abies lasiocarpa*), which from the British Columbia border extends north through the Selwyn and Ogilvie Ranges to some point north of Dawson, and from Mackenzie-Yukon watershed reaches westward to the eastern rim of the totally unglaciated western or central Yukon Plateau.

(2) An intermontane, low and dry plateau behind the Coast Ranges extends from Teslin Lake west to Kluane Lake. Lodgepole pine is the dominant forest tree in the eastern part on foothills and terraces, whereas low and flat former lake-bottom of Takhini and Shakwak Valleys is occupied by extensive grassland, fringed by white spruce and aspen bluffs.

(3) The flora of St. Elias Range is still very incompletely known, but its affinity is almost surely with that of the Alaska Range rather than with Hultén's "Upper Yukon."

(4) The western or central Yukon Plateau, including the somewhat isolated Dawson Range, comprises the central and western part of the upper Yukon Basin which lies north of Aishishik Basin, west of Glenlyon

and McArthur Mountains, and south of Ogilvie Range. It is believed entirely to have escaped the Wisconsin glaciation, and its flora is rich in species of endemic or disrupted range. Since Dawson City and the famous Yukon goldfields are in this province, its physiography, flora, and fauna are better known than are other parts of Yukon.

(5) Peel Plateau and Porcupine Plain are as yet almost completely unknown botanically but undoubtedly should be considered floristically distinct from the southern half of Yukon. In upper Peel Basin, the southern boundary of which is the height of land between Peel and Stewart Rivers, the dominant forest tree is said to be larch (*Larix laricina*), a species that is rare or absent in southern Yukon.

(6) East and north of Porcupine Plain, Richardson and British Mountains may form a separate arctic-alpine province. Its flora is completely unknown except for short excursions into Richardson Mountains west of Mackenzie Delta where the writer found a flora rich in both Cordilleran and Beringian radiants (Porsild, 1943).

(7) The arctic coastal plain of Yukon forms a narrow strip of land that is believed to have been unglaciated but, perhaps, partly submerged in glacial time. Its flora is fairly well known and is intermediate between that of the north coast of Alaska and the arctic Mackenzie lowlands.

AGE AND ORIGIN OF THE FLORA OF SOUTHEASTERN YUKON

From the analyses of plant communities in southeastern Yukon as well as from the study of the composition and distribution of species emerge specific data from which may be drawn certain conclusions regarding the probable age and origin of the flora.

Raup (1947) has done this for Brintnell Lake area on the east slope of Mackenzie Mountains, Northwest Territories, and has, moreover, successfully used the flora of this very limited area as a test for the general application of Hultén's hypothesis concerning the origin and distribution of all arctic and boreal floras (Hultén, 1937). With some slight modifications Raup finds that the distributional pattern agrees with that which was to be expected on the basis of Hultén's theory. As to the probable age and origin of the flora of Mackenzie Mountains, Raup, l.c., summarizes the results of his admirably and convincingly presented discussion, as follows:

"By way of summary, therefore, we may picture the Mackenzie Mountains as having been one of the latest montane areas to lose its glaciers (remnants of them still exist). While the glaciers were retreating there was a period of time during which the lower slopes were tundra-covered, with the tundra more or less continuous across the neighboring valleys and to neighboring mountain ranges. The length of the period is problematical, for it is impossible with present data to measure it accurately. There is some evidence, however, that forests did not come into the lower valleys until about 7,000 years ago, and that they did not cover the divides until somewhat later. In any case the tundra period must have been one in which the arctic and alpine plants of all the northwestern refugia had open routes of migration to the Mackenzie Mountains. There is evidence that they availed themselves of these routes in differing proportions, depending first upon their broad habitat preferences, and second upon their inherent abilities to migrate. Their success at colonizing the mountains was conditioned also by the remoteness of the various refugia. Plants of continental habitat preferences were of course most successful; and of these the wide-ranging Arctic-Montane group were outstanding because of both accessibility and lack of biotype depauperation. Survivors in the Yukon valley and the northern Rockies were second in numbers, for they were only partially depauperated and were near at hand. Northern Beringian and Coastal Radiants were next in importance, probably held in check both by distance and lack of plasticity.

"The process of alpine colonization appears to have been checked, at least for the Brintnell Lake region, before it had reached anything like completion. Evidence for this is to be found in the general paucity of species in the alpine plant cover. The "partial" nature of the flora is to be seen in all the common arctic families and genera. Such groups as *Potentilla, Senecio, Arnica,* and *Pedicularis,* all represented in surrounding regions by half a dozen or so species, have only 2 to 4 species each in the Brintnell Lake district. The colonization appears to have been stopped by the advance of forests into the surrounding valleys. These forests brought a new element to the mountain flora, derived from refugia south of the ice or on the slopes of the more southern mountains. Whether any of it came from the Yukon valley is uncertain. It was derived from Hultén's Boreal Circumpolar, Continental Western American, and possibly in part from his western coastal groups. In terms of range patterns outlined in this paper it was drawn chiefly from wide-ranging forest species and in part from the "timber-line" group. By nature it is aggressive, but probably shows so small a portion of the total Brintnell Lake flora as it does only because of the short time available for its invasion, and because of the subarctic situation of the Mackenzie Mountains."

Although at first glance it might appear hazardous to generalize from data obtained from such a limited area, Raup has drawn on his intimate knowledge of the northwestern flora as well as on his first-hand knowledge of species-behaviour obtained in the course of his extensive field experience in the upper Mackenzie Basin (Raup, 1934, 1935, 1936, 1942, and 1946). Although a direct comparison between the floras of the Brintnell Lake area and that of southeastern Yukon is not possible, nevertheless Raup's conclusions as regards the age and origin of the flora of Mackenzie Mountains apply equally well to a number of limited areas in southeastern Yukon.

Raup's concept of the dynamic progress of the colonization of the land surface laid bare by the retreat of the ice and the far-reaching effect which the subsequent, and probably very rapid, advance of the coniferous forest must have had on the arctic tundra vegetation is in close agreement with what actually occurred in post-pleistocene time in a comparable area in the Scandinavian peninsula (Smith, 1920). As regards present-time plant migration there can be no question that mountain areas such as found in Alaska, Yukon, and the Mackenzie district, when separated by extensive coniferous forests, are as isolated as were the islands surrounded by a vast sea.

A comparable phytogeographical analysis of the larger and much more complex flora of southeastern Yukon, though tempting, must await a much more thorough and detailed knowledge than we have at present of the floras of central Alaska and Yukon, on the one hand, and the flora of the almost entirely botanically unexplored northern British Columbia, on the other. It must suffice here briefly to mention some of the more salient features of the floristic aspects.

The detailed descriptions of plant communities given on pages 27 to 57 will have emphasized the strong contrasts that exist between the floras of the lowlands and valleys and the mountain plateaux above the upper limit of valley glaciation. Excepting such specialized valley habitats as lake shores, river-flats, and erosion fans, the flora of the heavily glaciated valleys in southeastern Yukon is dominated by a rather small assembly of wide-ranging forest species, whereas mountain plateaux, and even isolated mountains such as Mount Sheldon and Mount Riddell, above the 4,000-foot level, possess a rich and varied alpine flora characterized by a remarkably high percentage of distinctly Cordilleran species and by a general paucity of Beringian radiants as well as of wide-ranging high-arctic species. Although glacio-geological evidence favours the assumption that all mountains in southeastern Yukon were once glaciated (Bostock, 1948), the botanical evidence forcibly suggests that the alpine floras here are much older than those of the valleys and that they survived above the 4,000-foot level during the most recent Pleistocene advances of the ice.

From the presence in the alpine flora of Pelly Plateau and in the isolated mountain massifs north of Pelly Valley of (1) a large Cordilleran element, which in the Northwest here finds its northern limit, (2) a number of species of isolated or disjunct range, and (3) from the small percentages in the flora of southeastern Yukon of Beringian radiants and of wide-ranging high-arctic species, it would appear then that the unglaciated and dry central Yukon Plateau, on the one hand, and the extensively glaciated, moist west slopes of the Ogilvie, Selwyn, and Mackenzie Mountains (Keele, 1910; Bostock, 1948), on the other, have been effective barriers to the free interchange of species between southeastern Yukon and central Alaska, central Yukon, the Arctic slope, and the upper Porcupine-Peel Basin.

CATALOGUE OF THE VASCULAR FLORA OF YUKON

Exclusive of 60-odd that are obviously adventitious, 894 species, subspecies, or major varieties of well-defined geographical range are listed in the present catalogue as indigenous to the flora of Yukon. Of this number no less than 685 were noted by us in southeastern Yukon along Canol Road between Whitehorse and Mackenzie-Yukon Divide.

In the following synopsis of the Yukon flora, figures in brackets denote the number of species here recorded from southeastern Yukon: *Pteridophyta* 38 (32), *Gymnospermae* 9 (8), *Monocotyledonae* 234 (198), *Archichlamydeae* 383 (284), and *Metachlamydeae* 230 (164).

Families containing more than 10 species are: *Polypodiaceae* 16 (12), *Potamogetonaceae* 11 (11), *Gramineae* 83 (72), *Cyperaceae* 91 (76), *Juncaceae* 19 (18), *Orchidaceae* 13 (10), *Salicaceae* 39 (34), *Polygonaceae* 13 (12), *Caryophyllaceae* 39 (26), *Ranunculaceae* 36 (29), *Papaveraceae* 10 (4), *Cruciferae* 52 (34), *Saxifragaceae* 38 (25), *Rosaceae* 54 (44), *Leguminosae* 37 (27), *Onagraceae* 10 (10), *Ericaceae* 18 (17), *Primulaceae* 15 (8), *Gentianaceae* 11 (7), *Scrophulariaceae* 29 (16), and *Compositae* 106 (86).

The fact that most of the soils of southeastern Yukon are derived from acidic rocks is reflected in the high number of species in such largely oxylophytic families as *Gramineae, Cyperaceae, Juncaceae, Salicaceae, Polygonaceae, Ranunculaceae, Rosaceae, Onagraceae,* and *Ericaceae,* whereas the number of species found in southeastern Yukon in the largely calciphilous families *Caryophyllaceae, Cruciferae, Saxifragaceae, Leguminosae, Primulaceae, Scrophulariaceae,* and *Compositae* is significantly smaller.

Literature citations and synonyms have in most cases been omitted for species enumerated for Yukon by Hultén's Flora of Alaska and Yukon (Parts 1 to 9). For those species the reader is referred to that work for complete references to nomenclature and bibliography. For the large number of species here recorded for Yukon since the appearance of Hultén's Flora and for those not yet published by him (*Compositae*), I have cited only literature and synonyms pertinent to the flora of Yukon.

Under each species, specimens known to me from southeastern Yukon have been cited in detail followed by notes on their general Yukon distribution. For rare or critical species all Yukon collections known to me have been cited.

Following the local distribution is given the general distribution and in most cases also brief notes on frequency, vertical distribution, phenology, and taxonomy.

Hultén's monumental Flora, as shown by the frequent references throughout this work, has been a constant source of stimulation and of invaluable help even though I have frequently found myself in disagreement with the opinions expressed. Through Dr. Hultén's kindness, and despite the difficulties of war-time mailing, the first three parts of his Flora had reached me in 1944 in time to be taken to the field.

In the catalogue the undermentioned symbols indicate the herbarium in which the specimen cited was seen. Where no symbol is appended the specimen is in the Herbarium of the National Museum of Canada. Where no collector's name is given, the collection is that of A. E. Porsild and A. J. Breitung.

C – Herbarium of the University of Copenhagen, Denmark.
Cal – Herbarium of the University of California, Berkeley, Calif.
Can – Herbarium of the National Museum of Canada.
G – Gray Herbarium, Harvard University, Cambridge, Mass.
NY – Herbarium of the New York Botanical Garden.
S – Herbarium of the National Museum of Sweden, Stockholm.
US – United States National Herbarium, Washington, D.C.

The families and genera are arranged essentially according to Dalla Torre et Harms, Genera Siphonogamarum (1907). Within the genera the species, for the sake of convenience, are arranged alphabetically, except in the genus *Carex* where the arrangement followed is that of Mackenzie in N. Am. Fl. 18 (1935) and in the genus *Salix* where the species are arranged systematically.

The catalogue includes the following new or recently described species, subspecies, or varieties, based upon material secured in southwestern Yukon, in 1944, or on recent Yukon material in the National Herbarium: *Agropyron teslinense* n.sp., *Claytonia Bostockii* n.sp., *Thalictrum Breitungii* Boivin, *Papaver Keelei* Porsild, *Corydalis pauciflora* var. *albiflora* n.var., *Potentilla furcata* n.sp., *P. nivea* ssp. *fallax* n.ssp., *Dryas alaskensis* Porsild, *Oxytropis glutinosa* n.sp., *O. Huddelsonii* n.sp., *O. sheldonensis* n.sp., *O. verruculosa* n.sp., *O. viscidula* ssp. *sulphurea* n.ssp., *Podistera yukonensis* Math. & Const., *Gentiana Richardsonii* n.sp., *Aster elegantulus Porsild*, *Antennaria pulcherrima* var. *angustisquama* Porsild, *A. pedunculata* Porsild, *A. stolonifera* Porsild, *A. alborosea* Porsild, *A. Breitungii* Porsild, *A. elegans* Porsild, *A. incarnata* Porsild, *A. leuchippi* M. P. Porsild, *Senecio sheldonensis* Porsild, *S. yukonensis* Porsild, *Saussurea angustifolia* var. *yukonensis* Porsild, *Taraxacum pellianum* Porsild, and *Hieracium gracile* var. *yukonensis* Porsild.

The following new combinations or names are proposed: *Vahlodea atropurpurea* ssp. *latifolia* n.comb., *Kobresia hyperborea* nomen nov., *Juncus balticus* var. *alaskanus* n.comb., *Lesquerella arctica* ssp., *Purshii* stat. nov., *Potentilla diversifolia* ssp. *Ranunculus* (Lge.) n.comb., *P. Ledebouriana* n.nom., and *Senecio atropurpureus* var. *Ulmeri* n.comb.

POLYPODIACEAE

Woodsia alpina (Bolton) S. F. Gray; Hult., Fl. Al. and Yukon **1** : 13 (1941).

For discussion of the arctic plant *see* Porsild Rhod. **47** : 145-48 (1945).

Rose-Lapie River pass, Mile 118, east slope of granite-schist mountain, alpine scree, 4,000 feet, No. 10103. The species is rare and was not seen elsewhere. The only previous collection from Yukon is from near the Alaska-Yukon border, at Fortymile River.

Woodsia glabella R.Br. in Richards.; Hult., Fl. Al. and Yukon **1** : 13 (1941).

Rose-Lapie River pass, Mile 118, east slope of granite-schist mountain, No. 10104. Our specimens grew in a rocky scree at an elevation of 4,000 feet, not far from a colony of *W. alpina*. The species apparently is rare and was not observed elsewhere along Canol Road.

Woodsia ilvensis (L.) R.Br., Prod. Fl. Holl. **1** : 158 (1810).

Southeast slope of Mount Sheldon, opposite Mile 222, steep grassy slope, 4,500 feet, No. 11694. Although many places appeared suitable, the species was not observed elsewhere. New to the flora of Yukon.

Cystopteris fragilis (L.) Bernh.; Hult., Fl. Al. and Yukon **1** : 16 (1941).

Rose-Lapie River pass, Mile 118, east slope of granite-schist mountain, No. 10102; lower Lapie River crossing, Mile 132, grassy upper slopes of mountain south of road, No. 9599; Mount Sheldon, moist shaded ravines on southeast slope opposite Mile 222, No. 11696. The species was noted to be fairly common along Canol Road, especially on acid rocks.

Cystopteris montana (Lam.) Bernh.; Hult., Fl. Al. and Yukon **1** : 18 (1941).

Steep, densely wooded east shore of Quiet Lake, opposite Mile 55, No. 11107, where fertile specimens, 40 cm. tall, were collected on July 4. Previously recorded only from Dawson district.

Pteritis nodulosa (Michx.) Nieuwl. in Am. Midl. Nat. **4** : 334 (1916).

The species has not yet been collected in Yukon but is common at Liard Hot Springs, B.C., just outside the southeast boundary, A. E. Porsild, No. 9034. Hultén, l.c., reports it from a number of stations in southwest central Alaska.

Dryopteris austriaca (Jacq.) Woynar; Hult., Fl. Al. and Yukon **1** : 21 (1941).

Steep, densely wooded slopes east of Quiet Lake, opposite Mile 55-60, No. 11106; common in shaded ravines and alder thickets on east and south slope of Mount Sheldon opposite Mile 222, No. 11700. The species was very common and luxuriant here but was observed nowhere else on the Canol Road. New to the flora of Yukon.

Dryopteris fragrans (L.) Schott; Hult., Fl. Al. and Yukon **1** : 23 (1941).

Rose River valley, granite mountain opposite Mile 85-90, elevation 5,000 to 6,000 feet, No. 10156; common on fossil rock creep, granite range east of upper Rose River, Mile 95, No. 10479; Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, in a large rock scree, elevation 4,000 feet, No. 10105; alpine slopes above timber-line, northwest end of Itsi Range, opposite Mile 252, No. 11379. Probably common, especially on granitic rocks. Fully developed specimens with mature spores were collected as early as June 28.

Dryopteris fragrans (L.) Schott var. **remotiuscula** Kom. *See* Porsild in Nat. Mus., Canada, Bull. **101** : 29 (1945). For complete synonymy *see* Broun Index N. Am. Ferns 68 (1938).

Steep west slope of granite range east of upper Rose River, opposite Mile 95, No. 10480; south and east slopes of Mount Sheldon, opposite Mile 222, elevation 4,000 feet, No. 11698.

Fernald, Rhod. **25** : 3 (1923), gives the known range of var. *remotiuscula* as "temperate North America . . . west to Wisconsin and Minnesota, . . . and temperate eastern Asia." In addition to the above collections there are in the National Herbarium of Canada specimens collected on Yukon River between Whitehorse and the Alaska boundary, July 3, 1936, by E. & J. Lohbrunner; Lone Mountain, Nahanni River, N.W.T., Wynne-Edwards, No. 8415, and from east end of Lake Athabasca (Sask.), R. S. Campbell, Can., No. 132408. Further collecting will probably show that the range of this well-marked variety is continuous. New to the flora of Yukon.

Dryopteris Linneana C. Chr.; Hult., Fl. Al. and Yukon **1** : 25 (1941).

Steep, densely wooded east slope of Quiet Lake, No. 11105; upper Rose River, steep west slope of granite range opposite Mile 95, Nos. 10477 and 10478; south and east slopes of Mount Sheldon, opposite Mile 222, shaded ravine and alder thickets, 4,000 feet elevation, No. 11699; open, grassy slope, upper south fork of Macmillan River, opposite Mile 268, elevation 4,500 feet, No. 11312; Macmillan Pass, Mackenzie-Yukon Divide, elevation 4,500 feet, No. 11285.

Occasional or sometimes common in rich woods and alder thickets. The only previously recorded Yukon collections are from Alaska-Yukon boundary and from Lake Bennett.

Dryopteris Phegopteris (L.) Chr., Index Fil. 284 (1905).

South slope of Mount Sheldon, crevices of rock by a waterfall, elevation 4,500 feet, No. 11695; the above number represents the first and only collection from the Yukon; the specimens were small and sterile (August 3).

Dryopteris Robertiana (Hoffm.) C. Chr.; Hult., Fl. Al. and Yukon **1** : 29 (1941).

Recorded from central Yukon district but not seen by us.

Athyrium Filix femina (L.) Roth. ssp. **cyclosorum** (Rupr.) C. Chr.

Mayo district, McArthur Range, near the hot springs, 4,200 feet elevation, Bostock, No. 152.

New to the flora of Yukon but in Alaska common along the Pacific Coast north to Seward Peninsula and, besides, known from several stations in the interior.

Asplenium viride Hudson, Fl. Angl. 385 (1762).

Ogilvie Mountains, 10 miles from the Alaska border, July 16, 1936, E. & J. Lohbrunner (Can). The species is known from Seward Peninsula and from the eastern and central Pacific coast of Alaska but had not previously been recorded from Yukon.

Cryptogramma acrostichoides (L.) R. Br. apud Richardson, Bot. App. Frankl. Narr. 767 (1823).

South and east slopes of Mount Sheldon, opposite Mile 226, crevices of rock, elevation 4,500 feet, No. 11697. Locally common or even abundant on acid rocks only. New to the flora of Yukon.

Cryptogramma acrostichoides (L.) R. Br. var. **sitchense** (Rupr.) C. Chr.

Cr. crispa ssp. *acrostichoides* (R. Br.) Hult., Fl. Al. and Yukon **1** : 40 (1941).

Steep west slope of granite range east of Rose River, opposite Mile 95, No. 10476; Macmillan Pass, Mackenzie-Yukon Divide, steep scree of chert, elevation 4,500 feet, No. 11286. New to the flora of Yukon.

Cryptogramma Stelleri (S. G. Gmel.) Prantl.; Hult., Fl. Al. and Yukon **1** : 41 (1941).

Pellaea gracilis Macoun, Ottawa Nat. **13** : 217 (1899).

Ogilvie Mountains near the Alaska-Yukon boundary, E. & J. Lohbrunner, July 16, 1936 (Can); Fortymile Creek near Dawson (Tyrrell).

Polypodium vulgare L. ssp. **occidentale** (Hook.) Hult., Fl. Al. and Yukon **1** : 44 (1941).

Recorded from upper Yukon River but not seen by us.

OPHIOGLOSSACEAE

Botrychium boreale Milde ssp. **obtusilobum** (Rupr.) Clausen, Mem. Torr. Bot. Cl. 19, **2** : 81 (1938).

Pass between Teslin and Nisutlin Rivers, Mile 10-14, grassy alpine slope, No. 10969; upper Rose Valley, Mile 95, grassy places on outwash plain, growing together with *B. Lunaria*, No. 10428-A; same place, alpine meadows between 5,600 and 6,000 feet, No. 10541; same place, steep granite slope east of Rose River, in grassy, alpine meadows, No. 10481. Some of the specimens in the last number measure 23 cm. and on July 17 had almost fully mature sporangia. *B. boreale* ssp. *obtusilobum* is new to the flora of Yukon but has been recorded from Alaska and from northern British Columbia.

Botrychium lanceolatum (Gmel.) Ångstr. in Bot. Not. 68 (1854).

Southeast slope of Mount Sheldon, Mile 222, dry grassy slope 4,500 feet, No. 11758. These specimens are very small and slender, the largest measuring only 10 cm.; in the narrow segments of the sterile leaf they match ssp. *angustisegmentum* (Pease & Moore) Clausen, Bull. Torr. Bot. Cl. **64** : 280 (1937), but in view of the large spores, averaging 38μ, I have referred them to the species. The collection represents a notable extension of range as the species has not been collected between Shumagin Island in southwest Alaska and southern British Columbia.

Botrychium Lunaria (L.) Sw.; Hult., Fl. Al. and Yukon **1** : 48 (1941).

East slope of Rose River valley, Mile 77, in open pine forest, No. 10234; Rose River valley, Mile 95, grassy places on outwash plain, No. 10428; same place, grassy meadows, No. 10530; Rose-Lapie River pass, Mile 105, grassy slope above timber-line, No. 9382; same place, near lake shore, No. 9237; same place, grassy slopes by an alpine stream, No. 9789; Rose-Lapie River pass, southwest slope of granite mountain, Mile 116, No. 10048; lower Lapie Crossing, Mile 132, grassy slope, No. 9499; timbered lower slopes of Mount Sheldon, Mile 222, alpine meadow, No. 11649; summit of Mount Sheldon, rocky ledge at 7,000 feet elevation, No. 11734.

Occasional or even common in alpine and subalpine meadows.

The material is somewhat variable in regard to the shape of the sterile frond, and some specimens might be placed in the var. *onondagense* (Underw.) House. Where mature spores are available they are uniform in size, averaging one-third smaller in diameter than the following. In Yukon the species was previously known from Dawson district only.

Botrychium Lunaria (L.) Sw. var. **minganense** (Victorin) Dole, Fl. Vermont 1 ed. **3** : 1 (1937).

Upper Rose River valley, Mile 95, meadows along Rose River, No. 10337; Macmillan Pass, Yukon-Mackenzie Divide, Mile 284–290, alpine, treeless meadow, No. 11178. Both numbers have mature spores that are uniform in size averaging 40 to 45 μ, or one and a half times as large in diameter as those of the species. New to the flora of Yukon.

Botrychium virginianum (L.) Sw.

This species thus far has not been collected in Yukon proper but was recently collected at Liard Hot Springs, B.C., not far from Yukon boundary, Anderson and Brown, No. 10360 (Can).

EQUISETACEAE

Equisetum arvense L.; Hult., Fl. Al. and Yukon **1**: 51 (1941).

West bank of Nisutlin River, opposite Mile 36 in a meadow, No. 10711; lower Lapie River crossing, Mile 132, in rich poplar woods, No. 9820.

Common in suitable places along Canol Road especially in the lowlands and noted in all places where plant collections were made; on Mount Sheldon up to 6,000 feet elevation. The species is of considerable importance to wildlife; the green, sterile plant and also the starch-filled root-tubers furnish an important food supply for a large number of herbivorous mammals and birds.

Equisetum hiemale L. var. **californicum** Milde in Nov. Act. Acad. Caes. Leop. Carol. **32,** 2 : 517 (1867).

Dry south-facing slopes east of Lewes River, 2 miles east of Whitehorse, No. 9123; same place, No. 10639; Johnson Crossing, Mile 0, M.P. and R. T. Porsild, No. 592.

The first collection is that of young fertile plants with scarcely opened sporangia (June 1-5); the specimens in the second collection (July 26) are fully mature with stems 40 to 60 cm. high and 0·5 cm. in diameter, in which most of the teeth of the sheaths have been lost. In the National Herbarium, Ottawa, there is a specimen collected at Dawson, M.O. Malte, No. 80. All have two rows of tubercles on the stem ridges and, following Hultén, Fl. Alaska and Yukon, belong with the var. *californicum.* New to the flora of Yukon but previously recorded from Alaska and northern British Columbia.

Equisetum limosum L.; Hult., Fl. Al. and Yukon **1** : 54 (1941).

Upper Rose River valley, opposite Mile 95 in a wet meadow, young fertile plants with sporangia just opened on July 11, No. 10339; Rose-Lapie River pass, Mile 105, on a sandy river-flat flooded in spring but dry during the summer, No. 9238; Ross River valley, alluvial flat near north end of Sheldon Lake, fertile branching plants growing in a slough, No. 11501.

A lowland species which was common locally in sloughs and wet meadows of Rose-Lapie River pass and on Ross River. On upper Lapie River a terrestrial form (No. 9238) formed pure stands on alluvial flats flooded in spring where, later in the season, it formed extensive lush-green "meadows."

Equisetum palustre L.; Hult., Fl. Al. and Yukon **1** : 55 (1941).

In ponds and wet meadows near headwaters of Rose River, elevation 4,000 feet, sterile plants on July 12, No. 11888; lower Lapie River opposite Mile 127, fertile specimens on gravelly river-flat, June 27, No. 9995.

Rare or occasional; previously known in Yukon from two collections in Dawson district.

Equisetum pratense Ehrh.; Hult., Fl. Al. and Yukon **1** : 56 (1941).

River-banks and alluvial flats along the west bank of Nisutlin River, opposite Mile 36-42, No. 10710; Rose-Lapie River pass, Mile 105, near Lapie Lake, in a ravine by an alpine brook, No. 9791; Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, No. 10116; lower Lapie River, Mile 132, rich poplar woods, Nos. 9557 and 9821; northeast shoulder of Mount Sheldon, in a *Picea mariana* muskeg, No. 11058; Macmillan Pass, Mackenzie-Yukon Divide, on a river-flat, elevation 4,600 feet, No. 11179.

A common species along the Canol Road, characteristic of rich forest in the lowlands. On Mount Sheldon it ascended only to the lower slopes. Our material all represents the green, sterile plant, and, as with *E. arvense*, the vernal, fertile plant was already past by the first week of June.

Equisetum scirpoides Michx.; Hult., Fl. Al. and Yukon **1** : 57 (1941).

Whitehorse, common in spruce woods, No. 9124; east slope of Rose River valley, opposite Mile 77, common in pine and spruce woods, No. 10236-A; lower Lapie River crossing, almost fully opened sporangia on June 10, No. 9256; same place, in rich poplar woods, No. 9558; northeast shoulder of Mount Sheldon, very scarce on alpine slope, 5,100 feet, No. 11056; Macmillan Pass, Mackenzie-Yukon Divide, on barren, treeless tundra, No. 11180.

A ubiquitous woodland species common in the lowland but rare or wanting above timber-line. It has been collected only once on the Arctic Coast, at King Point, Porsild, No. 7155-A, but probably occurs in suitable places elsewhere in northern parts of Yukon.

Equisetum sylvaticum L. var. **pauciramosum** Milde in Mon. Equiset. 292 (1865).

East slope of Rose River valley, opposite Mile 77, common in pine and spruce woods, No. 10236.

A ubiquitous and dominant species of the lowland spruce forest but rare or even absent outside the area of acid Precambrian rocks. Thus, the species was noted as occasional only between Mile 14 and 105. It was not seen on the calcareous shales of Whitehorse nor in the Lapie-Pelly River country but became very common or even dominant in the muskeg country of Ross and Macmillan Rivers between Mile 160 and 282; not seen again in the limestone country east of the divide. On Mount Sheldon, *E. sylvaticum* var. *pauciramosum* grew on the lower slopes only and was not observed above 4,000 feet elevation. The specimens cited, like hundreds of others examined in the field, show the smooth branches characteristic of the var. *pauciramosum*, as do all other Yukon material seen by the writer. (Compare Hult., l.c., p. 58.)

Equisetum variegatum Schleich.; Hult., Fl. Al. and Yukon **1** : 59 (1941).

Low, alluvial island in Lewes River below Whitehorse where it formed a dense, green sward, No. 9122; on gravel bars on the lower Lapie River, Mile 132, No. 9529; upper Rose River Valley, sandy river-flats opposite Mile 95, No. 10338; northeast shoulder of Mount Sheldon, marshy edge of glacial lake, No. 11057.

Number 10338 is more high-grown than the rest of the material, with some stems 3 mm. in diameter and 50 cm. high. Although some stems have 10 ridges, the specimens seem to belong with the species rather than with ssp. *alaskanum* (Eaton) Hultén, Fl. Alaska and Yukon **1** : 59 (1941). In addition to the above collections the species was recorded from all places where collections were made. A lowland species common throughout the district on alluvial gravel bars in rivers and on sandy or gravelly lake shores. It was rarely seen in the mountains and on Mount Sheldon reached only to timber-line.

LYCOPODIACEAE

Lycopodium alpinum L.; Hult., Fl. Al. and Yukon **1** : 62 (1941).

Pass between Teslin and Nisutlin Rivers, Mile 10-14, alpine tundra, 6,000 feet elevation, No. 10971; Rose River valley, granite mountain east of river, alpine slope above timber-line, No. 10157; Rose-Lapie River pass, schist mountain east of lake opposite Mile 105, alpine slopes above timber-line, Nos. 9384 and 9370; south shoulder of Mount Sheldon, timbered lower slopes in open fir forest, 4,500 feet elevation, No. 11652.

An alpine species occasional or common locally and recorded from most of the mountains climbed. The species appears to be absent from the calcareous shales and schists of the Lapie-Pelly River region. Mature sporangia were not noted until the first week of August.

Lycopodium annotinum L.; Hult., Fl. Al. and Yukon **1** : 63 (1941).

Pass between Teslin and Nisutlin River, in alpine fir forest near timber-line, 4,500 feet elevation, No. 10970; alpine slopes of granite range east of Rose River, opposite Mile 95, open alpine fir forest, 4,500 feet elevation, No. 10484; Rose-Lapie River pass, subalpine fir forest on schist mountain opposite Mile 105, No. 9385; lower Lapie River crossing, Mile 132, timber-line spruce forest on moist north slope, elevation 4,500 feet, No. 9704; lower south and east slopes of Mount Sheldon, opposite Mile 222, in dense fir-spruce forest, No. 11701; south shoulder of Mount Sheldon, timber-line fir forest, elevation 4,500 feet, No. 11653.

The material in the above series all has thin, flat, spreading, and distinctly serrate leaves which, as pointed out by Hultén, l.c., p. 65, is characteristic for the species and its var. *alpestre* Hartm. It is common in rather moist subalpine forest along Canol Road north to Mount Sheldon.

The numbers in the following series belong to the alpine or arctic var. *pungens* (La Pylaie) Desv., which is distinguished by narrow, appressed and entire leaves.

West bank of Nisutlin River opposite Mile 36-42, in a peat bog, No. 10713; east slope of Rose River valley, near Mile 77, in a spruce bog, No. 10237; steep west slope of granite range east of upper Rose River opposite Mile 95, subalpine tundra, No. 10482; Rose-Lapie River pass, grassy summit of mountain east of Mile 105, 6,000 feet elevation, No. 10879; Rose-Lapie River pass, alpine slopes of granite mountain west of Mile 116, No. 10049; Macmillan Pass, Mackenzie-Yukon Divide, No. 11181.

The var. *pungens* is common in peat bogs and alpine tundra above timber-line. As stated by Hultén, l.c., there is a certain amount of intergradation between the species and the var. *pungens*. Thus in Nos. 10713 and 10237 the leaves of this year are essentially entire, whereas in some of last year's they are distinctly serrate. Plants with mature sporangia were noted as early as June 10.

Lycopodium clavatum L. var. **monostachyon** Grev. & Hook.; Hult., Fl. Al. and Yukon **1** : 67 (1941).

West bank of Nisutlin River, in a peat bog, No. 10712; Rose River valley, granite range east of river opposite Mile 85-90, No. 10158; west slope of granite range east of Rose River opposite Mile 95, alpine slopes near timber-line, No. 10483; northeast spur of Mount Sheldon, open burnt-over spruce woods opposite Mile 226-227, No. 11441; south shoulder of Mount Sheldon, subalpine fir forest near timber-line, elevation 4,500 feet, No. 11651; shaly mountain west of upper Macmillan River, opposite Mile 268, in open timber-line fir forest, No. 11313.

Common in subalpine forests of the acid rock region along the Canol Road. Not observed on the calcareous rocks of Lapie-Pelly River. Plants with mature sporangia were first noted on July 6. Near the northern limit and at high altitudes the species is often sterile. The above series, as well as all other material seen from Yukon, belongs to the boreal var. *monostachyon* which has a single spike on a short peduncle rarely more than 2 cm. long.

Lycopodium complanatum L. var. **canadense** Vict. in Contr. Lab. Bot. Univ. Montr. **3** : 70 (1925).

L. complanatum Hult., Fl. Al. and Yukon **1** : 68 (1941).

Whitehorse, in open lodgepole pine forest east of Lewes River, No. 9125; pass between Teslin and Nisutlin Rivers, Mile 14, alpine slopes above timber-line, elevation 5,000 feet, No. 10971-A; in spruce forest on alluvial flats along west bank of Nisutlin River opposite Mile 36-42, No. 10714; in open lodgepole pine forest in Rose River valley near Mile 77, No. 10238; Rose-Lapie River pass, upper slopes of schist mountain east of lake, No. 9386; south and east slopes of Mount Sheldon, steep ledges and slopes above timber-line, elevation 5,000 feet, No. 11759; Rose River valley near north end of Sheldon Lake, in open spruce forest, No. 11500.

A common species of dry open spruce and pine woods of the southern part of the road. Above timber-line and near its northern limit west of Macmillan Pass it is probably most often sterile; in fact, specimens with mature, opened sporangia were not noted before the middle of August even in the lowland.

Lycopodium obscurum L. var. **dendroideum** (Michx.) Eaton.; Hult., Fl. Al. and Yukon **1** : 69 (1941).

In the Yukon recorded once from the Dawson district; not seen by us.

Lycopodium sabinaefolium Willd. var. **sitchense** (Rupr.) Fern. in Rhod. **25** : 116 (1923).

Haines Road, B.C., just south of Yukon boundary, M. P. and R. T. Porsild, Nos. 156 and 236; same locality, Clarke, No. 579. The species is common on the Pacific Coast and, although as yet not collected in Yukon, may be expected to occur on high mountains of the interior.

Lycopodium Selago L.; Hult., Fl. Al. and Yukon **1** : 71 (1941).

Rose-Lapie River pass, alpine slopes above timber-line of mountain east of Mile 105, No. 9383; lower Lapie River crossing, grassy summit of mountain south of Mile 132, elevation 5,600 feet, No. 9898; south shoulder of Mount Sheldon, grassy slope above timber-line, elevation 5,000 feet, No. 11584; saddle between Mount Sheldon and Mount Riddell, elevation 4,300 feet, in a *Scirpus caespitosus* bog, No. 11650.

A common alpine species noted on all mountains between Teslin and Macmillan Pass. The numbers in the above series all belong to the var. *appressum* Desv.

SELAGINELLACEAE

Selaginella selaginoides (L.) Link in Fil. Spec. Hort. Berol. 158 (1841).

Moist, grassy river-bank of Nisutlin River, opposite Mile 36-42, No. 10715; Rose River valley near Mile 77, No. 10235; upper Rose River valley, near Mile 95, in grassy places on river-flat, No. 10429; Rose-Lapie River pass, in a subalpine meadow by a brook, No. 9790; Pelly River valley, near Mile 136, No. 9763; Macmillan Pass, Mackenzie-Yukon Divide, alpine treeless meadow, elevation 4,600 feet, No. 11182.

Occasional or even common locally in the lowland, in moist, grassy places and by brooks; perhaps always on calcareous soil. New to the flora of Yukon, but previously recorded from adjacent British Columbia and Alaska.

Selaginella sibirica (Milde) Hieron.; Hult., Fl. Al. and Yukon **1** : 75 (1941).

In Yukon recorded from a few stations in Dawson district.

ISOËTACEAE

Isoëtes Braunii Dur. in Bull. Loc. Bot. Fr. **11** : 101 (1864).

In shallow water, south end of Sheldon Lake, opposite Mile 219, No. 11502.

Our specimens were collected on August 17, together with *Eleocharis acicularis* var. *submersa*, on the muddy bottom of water about one foot deep, not far from the trading-post. The fully mature macrospores average between 0·4 and 0·5 mm. in diameter and show well-developed spines characteristic of the species. Apparently quite rare. The above collection constitutes a considerable extension of the known northwestern range of this species which has previously been recorded from the Aleutian and Kodiak Islands and from Great Bear Lake.

PINACEAE

Pinus contorta Loud. var. **latifolia** Engelm. in King's Rept. **5** : 331 (1871).

P. contorta Hult., Fl. Al. and Yukon **1** : 77 (1941).

Whitehorse, forming pure stands on sandy river terraces, No. 9130; east slope of Rose River valley, sandy river terraces, elevation 3,000 feet, No. 10240.

The lodgepole pine is a dominant forest tree on sandy soil along the highway between Whitehorse and Teslin Lake where it often forms pure stands with trunks up to 18 inches in diameter. Along the Canol Road it is common in the southern part but rarely occurs as a dominant species except on burnt-over land. Its best development is reached on sandy river terraces of the Nisutlin and lower Rose River, between Mile 30 and 80, where extensive forests occur of pine mixed with white spruce. The general elevation here is about 3,000 feet. On poorly drained glacial till on the swampy, lake-filled flats west of Nisutlin River between Mile 30 and 50, the pine is low and scrubby, although often the dominant tree, and here forms dense thickets, whereas, on well-drained sandy soil near the river, it grows in open, park-like stands. *See* map, fig. 2.

On upper Rose River the pine no longer forms pure stands but grows mixed with white spruce and alpine fir. Generally speaking, it is restricted to the valley bottom, but at Mile 95 isolated trees were noted in the alpine fir forest all the way to timber-line at 4,600 feet. Isolated, scrubby pines were even noted here in an alpine meadow at 5,600 feet. On upper Lapie River the pine is limited to the valley bottom, but becomes progressively scarcer, and finally disappears when the calcareous schists and shales of the lower Lapie and Pelly Rivers are reached. The pine is totally absent on the Pelly and on lower Ross River, but a few isolated groups of trees were again seen on sandy ridges in the broad valley of the Ross between Mile 174 and 178. The last place apparently represents the northern limit of the pine along the Canol Road. Abundant reproduction is the rule except in alpine situations where all trees seen were sterile.

The pine is of economic importance only when it grows in pure stands; thus, in the vicinity of Whitehorse it supplies practically all the firewood used, as well as some logs for construction purposes.

Larix laricina (Du Roi) Koch var. **alaskensis** (Wight) Raup in Sargentia **6** : 105 (1947) map Plate 14; Hult., Fl. Al. and Yukon **1** : 79 (1941).

Hultén, l.c., p. 79, points out that in Alaska and Yukon the larch "is almost entirely confined to the parts that were not glaciated during the Pleistocene glaciation." Actually the situation is not so simple as that, for the larch is absent in large areas in central Alaska and Yukon that were never glaciated but rather widespread in heavily glaciated parts of northwestern Mackenzie district as well as farther eastward. Although recent, as yet unverified reports suggest that the larch may be common in the upper Peel Basin, it has thus far actually been collected only a few times in Yukon, in the extreme southeast corner (Woodside River, Keele, 1910) and in the Northwest, on Black River near the Arctic Circle.

Larix laricina is a decided calciphile which in Yukon and Northwest Territories is restricted to strongly calcareous rocks of the cenozoic, mesozoic, and palæozoic series. We did not see it along the Canol Road until we had crossed to the east slope of Mackenzie Mountains. It is to be expected that the larch enters Yukon also along the northwestern extension of Mackenzie Mountains: the Ogilvie Mountains. In Mackenzie district it extends north to the Mackenzie Delta and to Great Bear Lake.

Picea glauca (Moench) Voss var. **albertiana** (S. Brown) Sargent. *See* Raup, Sargentia **6** : 102 (1947).

P. glauca Hult., Fl. Al. and Yukon **1** : 80 (1941).

Pelly River valley, south of Ross Post, No. 9648-A.

Along Canol Road the var. *albertiana* is more arctic-alpine than var. *Porsildii* (*See* this).

Picea glauca (Moench) Voss var. **Porsildii** Raup, Sargentia **6** : 102 (1947), tab. 12.

Whitehorse, dry slopes in open pine forest, No. 9129; lower Lapie River crossing, in a poplar grove, tree 50 feet high and 8 inches in diameter, with smooth, blistered bark, No. 9822; Pelly Valley, rolling lake-filled plain south of Pelly River, No. 9648; lower Lapie crossing, dry, shaly slopes of mountain west of road opposite Mile 132, a 40-foot tree, No. 9454.

Typical var. *Porsildii* is at once distinguished from var. *albertiana* by its comparatively smooth bark which often shows distinct resin blisters, not unlike those found in the genus *Abies*. In outline the tree is pyramidal or somewhat bulb-shaped, not narrow and spire-like as var. *albertiana*. The cones are short-cylindrical and dark as in var. *albertiana*.

The var. *Porsildii* is the dominant spruce on the southern part of Canol Road where it grows in the lowland ascending to moderate altitudes, but only occasionally to timber-line. At Lapie River crossing and also at Mount Sheldon, trees measuring 100 feet in height and with a diameter of 18 inches at breast height were not uncommon. North of Mount Sheldon all spruce seen belonged to var. *albertiana*. Although var. *albertiana* is more arctic-alpine, the two varieties frequently were seen growing together. *See* map, fig. 2.

Although white spruce is a common or even dominant tree along the Canol Road, stands of timber of commercial size are limited to the broad alluvial flats of lower Nisutlin River, the east and south slope of Quiet Lake and Pelly and lower Lapie Rivers. Small stands of commercial timber were also seen on lower Ross River and near Sheldon Lake. During construction of the road and pipeline, sawmills were operated in several places, but the lumber produced was of rather poor quality suitable only for rough construction purposes. A tree (var. *albertiana*) that grew by a small brook on well-drained soil at Mile 252 on the south fork of Macmillan River measured 80 feet (24 m.) with a diameter at breast height of 19 inches (49 cm.); the wood was sound to the core and showed 175 annual rings. In the valley of the Mackenzie the var. *Porsildii* is the dominant spruce on rich, alluvial soils, extending north to the delta.

Picea mariana (Mill.) B.S.P.; Hult., Fl. Al. and Yukon **1** : 82 (1941).

East slope of Rose River valley, near Mile 77, occasional on dry pine ridges, No. 10239; Rose-Lapie River pass, Mile 105, boggy places by lake shore, Nos. 9239 and 9240; Pelly River valley, south of Pelly River, layering, prostrate branches in a muskeg, No. 9649; same place, single tree in forest of white spruce, No. 9637; lower south slope of Mount Sheldon, in a mixed stand of white spruce, fir, and birch, No. 11702.

The distribution of black spruce along Canol Road is rather curious and not at all continuous; thus, on the southern half of the road the species was rare, or at least not common, even in places where it might have been expected to occur. Except for two small areas, one on Nisutlin River at Mile 42 and the other in Pelly River valley at Mile 136, no black spruce bogs were seen, and wherever the species did occur it grew mixed with pine or white spruce. From Mile 163 in the Ross River valley black spruce becomes the dominant lowland species forming extensive pure stands on the flat, poorly drained glacial clays and tills of the valley bottoms of Ross and Macmillan Rivers. *See* map, fig. 2.

A rather curious and apparently well-marked form, with short leaves and very slender, pendulous branches, was observed in a number of places (No. 10239). Layering is very common, especially on muskeg sites, and is believed to be the principal means of reproduction in such habitats.

A tree that grew in a muskeg at Mile 252 measured 6·5 cm. in diameter and had 131 annual rings.

Picea sitchensis (Bong.) Carr., Trait. Conif. p. 260 (1855).

Dalton Trail, near Police camp, 1898, J. B. Tyrrell (Can); Haines Road, Mile 85, Clarke, Nos. 372 and 574.

A Pacific Coast species which barely enters Yukon in the southwest corner.

Tsuga heterophylla (Raf.) Sarg.; Hult., Fl. Al. and Yukon **1** : 84 (1941).

Hulten, l.c., cites a specimen alleged to have been collected, in 1898, at Whitehorse Rapids by Bolton (US). From his knowledge of the climatic requirements of *Tsuga heterophylla*, as well as of the composition of the flora of Whitehorse district, the writer doubts that Bolton's specimen was actually collected in Yukon.

Abies lasiocarpa (Hook.) Nutt.; Hult., Fl. Al. and Yukon **1** : 87 (1941).

Upper Rose River valley, Mile 95, lower slopes of granite mountain, No. 10340; same place, mountain range west of river, scrub forest near timber-line, elevation 5,600 feet, No. 10542; Rose-Lapie River pass, Mile 105, upper slopes of mountain east of lake, No. 9387; upper Lapie River, east slope of mountain opposite Mile 118, No. 10106; south shoulder of Mount Sheldon, subalpine timber-line forest, 4,600 feet elevation, No. 11654; Macmillan Pass, Mackenzie-Yukon Divide, Mile 284, isolated trees near timber-line, elevation 4,600 feet, No. 11184.

The alpine fir is a common or even dominant species on moist alpine slopes of granitic or acidic mountains along Canol Road but appears to be absent in the dry, calcareous shales and schists of the lower Lapie, the Pelly, and lower Ross River. In Teslin-Nisutlin River pass and again in the southern half of Rose-Lapie River pass, the fir is the dominant forest tree on all mountains, whereas white spruce here is narrowly limited to the valley bottoms. On the drier south slopes at the north end of Rose-Lapie Pass, the fir, on the other hand, grows mixed with black and white spruce to timber-line. *See* map, fig. 2.

At timber-line, which here lies about 5,000 feet elevation, the fir forms a low scrub, often forming "islands" that give the observer the impression that it is conquering new ground. In the centre of such "islands" a few trees grow upright with erect trunks 10 to 14 feet high. The species reproduce abundantly by layering and such "islands" often appear to have been formed in this manner from a central "mother tree." Above the timber-line isolated clumps of trees are found in sheltered places, and at Mile 95 the absolute altitudinal limit of the species was at 6,000 feet elevation.

On steep mountain slopes the trunks are depressed by snow pressure and grow horizontally, pointing downhill, with only the tops and some of the branches arching upwards. The *Krummholz* thickets formed in this manner offer little resistance to snowslides but are formidable barriers to the mountain climber.

The fir is found only exceptionally on the lowland in valley bottoms at moderate elevation. Thus, east of the Nisutlin River it was seen in a pine forest with *Betula papyrifera* var. *neo-alaskana* and *Alnus crispa.*

No fir was seen between Mile 118 and 218, whereas on the slopes of Mount Sheldon it was again the dominant timber-line species. In rich soil at the moist base of the east slope, trees 80 feet tall were seen which at breast height measured 46 cm. (18 inches) in diameter. In one tree 121 annual rings were counted; the last 12 were very narrow, whereas the first 109 showed a rapid growth with rings of uniform width averaging 0·4 cm.

On Macmillan River above Mile 264 the fir dominates even on valley bottoms. At Mile 282, elevation 4,200 feet, at the west end of Macmillan Pass, it forms a scrub forest which reaches 500 feet up the north side of the valley, but even here the absolute altitudinal limit is 6,000 feet, at which altitude isolated prostrate trees were seen. Inside the pass, isolated trees were seen extending only a short distance beyond the continuous forest. A few stunted trees were seen for a short distance east of the divide.

According to information kindly supplied by Dr. Hugh S. Bostock, the fir extends west in MacArthur Range to approximately south of McQuesten and in Ogilvie Range approximately to the head of Fifteen Mile Creek about due north of Dawson.

Where best developed along the Canol Road, *Abies lasiocarpa* perhaps normally produces and matures seed, but nowhere was there any evidence of abundant seed production. The season of 1944 apparently was not a good seed year. The species appeared always to be sterile at timber-line. This was also the case on upper Macmillan River, where no evidence was found of mature cones of former years. The species reproduces abundantly by layering.

In Yukon previously recorded only from Lake Bennett.

Juniperus communis L. var. **montana** Ait.; Hult., Fl. Al. and Yukon **1** : 89 (1941).

Whitehorse, common on steep mountainsides, No. 9126 ♂; same place, on sandy slopes, No. 9127 ♀; west bank of Nisutlin River, forming a scrub 4 feet high on steep clay banks, No. 10716; Rose-Lapie River pass, Mile 105, forming dense thickets in open forest, Nos. 9284 and 9285 (♂ and ♀); lower Lapie River crossing, Mile 132, open sandy slopes, No. 9530; same place, with mature fruit on July 2, No. 10043; Macmillan Pass, Mackenzie-Yukon Divide, between Mile 284-290, alpine open country, elevation 4,600 feet, No. 11183.

The species is common along Canol Road where it forms low thickets on dry, south-facing slopes and in open woods. At Mile 95 it was noted to 5,600 feet elevation.

Juniperus horizontalis Moench; Hult., Fl. Al. and Yukon **1** : 91 (1941).

Whitehorse, flowering specimens on dry slope, June 6, No. 9128; same place, with mature fruits of the year, July 28 and 29, No. 10640. Common on calcareous shales at Whitehorse and along the highway east to Johnson Crossing but was not observed elsewhere by us.

SPARGANIACEAE

Sparganium angustifolium Michx. in Fl. Bor.-Am. **2** : 189 (1803).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 454, 547, and 766; west bank of Nisutlin River, bogs and marshes on river-flat, No. 10718; Rose-Lapie River pass, ponds in wet meadows near headwaters of Rose River, elevation 4,000 feet, Nos. 11892 and 11913. In addition, the species was noted as very common in lakes and sloughs in the Ross River valley, near Sheldon Lake. The species is new to the flora of Yukon.

Sparganium glomeratum Laest.; Porsild in Can. Field-Nat. **56** : 112 (1942).

This species, otherwise of Eurasian range, has recently been recognized in North America, in three widely disjunct areas: North shore of the Gulf of St. Lawrence, Minnesota, and Dawson, Yukon, Malte, No. 82.

Sparganium hyperboreum Laest.; Hult., Fl. Al. and Yukon **1** : 93 (1941).

In the Yukon recorded only from Dawson district.

Sparganium minimum (Hartm.) Fr.; Hult., Fl. Al. and Yukon **1** : 94 (1941).

In Yukon recorded only from Dawson district.

POTAMOGETONACEAE

Potamogeton alpinus Balbis ssp. **tenuifolius** (Raf.) Hult., Fl. Al. and Yukon **1** : 98 (1941).

Alluvial flats along west bank of Nisutlin River, opposite Mile 42, in ponds and sloughs, flowering specimens, July 23-26, No. 10719; Rose-Lapie River pass, Mile 98-99, ponds near headwaters of Rose River, elevation 4,000 feet, sterile specimens, July 12, No. 11891; Ross River valley, Mile 222, muddy slough near north end of Sheldon Lake, fruiting specimens, August 1, No. 11504; same place, in a shallow lake, flowering specimens, August 8, No. 11508; same place, specimens with well-developed tubers, August 16, No. 11514.

A late-flowering species which is probably common in all shallow, muddy lakes and in stagnant sloughs. Abundant production of root tubers was noted near Sheldon Lake in mid-August.

Potamogeton filiformis Pers. var. **borealis** (Raf.) St. John; Hult., Fl. Al. and Yukon **1** : 99 (1941).

Whitehorse, M. P. and R. T. Porsild, No. 269; Pelly River valley, alkaline ponds and sloughs near Mile 136-138, fruiting specimens, July 7, No. 11163; Ross River valley, in lakes and ponds near north end of Sheldon Lake, fruiting specimens, August 8, No. 11509; same place, fruiting specimens with abundant production of root tubers, No. 11515.

A common and early flowering and fruiting species. Number 11509 by its much branching habit resembles *P. pectinatus*, but the mature fruits are beakless and have sessile stigmas; the fruiting spikes are very dense, with the lowest verticels of achenes only slightly removed.

Potamogeton gramineus L., Sp. Pl. 127 (1753).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 455 and 765; south end of Sheldon Lake, in a sheltered bay near trading-post, No. 11517. Last year's specimens were noted in pond at Mile 98 near headwaters of Rose River. Collected at Mayo by Anderson, No. 9767.

In Sheldon lake district the species was not noted except in one lake where it grew abundantly in shallow muddy water. The fact that only a single fruiting head could be found may be due merely to the presence of large numbers of ducks which feed on the fruits and tubers of this and other species of *Potamogeton*. New to the flora of Yukon.

Potamogeton natans L., Sp. Pl. 126 (1753).

As yet not collected in Yukon but recorded from the Pacific coast of Alaska and, recently, also in central Alaska along the Alaska Highway near the Yukon border, Anderson, No. 9147.

Potamogeton panormitanus Biv. var. **major** G. Fisch. *See* Fernald in Mem. Gray Herb. **3** : 60-66, map, fig. 10 (1932).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 457; Ross River valley, shallow lakes and ponds near Sheldon Lake, No. 11512; shallow bay near south end of Sheldon Lake, No. 11519.

The specimens from Johnson Crossing flowered on July 14, whereas those from Ross River and Sheldon Lake were sterile in mid-August. All are a good match for authentic specimens in the National Herbarium of Canada.

The above collections constitute a considerable extension of the known Canadian range of this species, formerly known from Gaspé, Quebec, to northern Alberta (Wood Buffalo Park, Raup, No. 1568 (Can)) and from southern British Columbia.

Potamogeton pectinatus L., Sp. Pl. 127 (1753).

Whitehorse, in shallow places in Lewes River, flowering specimens, July 28-29, No. 10645; alluvial marshy flats west of Nisutlin River, Mile 36-42, flowering specimens in shallow ponds, July 23-26, No. 10721; in a lily pond on upland bench west of Nisutlin River, Mile 46, flowering specimens, July 23-26, No. 10720; Rose-Lapie River pass, ponds near headwaters of Rose River, sterile plants, July 12, No. 11889.

A late-flowering species which, apparently, is rare or occasional and is found in the southern part of the region only. New to the flora of Yukon but recorded from adjacent parts of Alaska and from Mackenzie Delta.

Potamogeton perfoliatus L., Hult., Fl. Al. and Yukon **1** : 101 (1941).

Ross River valley, ponds and sloughs near north end of Sheldon Lake Nos. 11505, 11510, and 11518.

Apparently a rare and late-flowering species in Yukon; in mid-August it had just reached the flowering stage, when *P. Richardsonii* already had mature fruits. It is new to the flora of Yukon but has been recorded from Rat River, west of Mackenzie Delta (N.W.T.).

Potamogeton Porsildiorum Fern. in Mem. Gray Herb. **3** : 40-42 (1932).

Ross River valley, in shallow lakes and sloughs near Sheldon Lake, Nos. 11506 and 11511.

The collections came from separate lakes several miles apart and on August 8 showed well-developed winter buds. In each collection a few flowering specimens were found, but the species probably does not normally produce mature fruits at Sheldon Lake. The species, which is new to the flora of Yukon, is known from central Alaska, Kotzebue Sound, Mackenzie Delta (type locality), and from Twin Island in James Bay.

Potamogeton pusillus L.; Hult., Fl. Al. and Yukon **1** : 103 (1941).

Whitehorse, in shallow water in Lewes River, No. 10644. The species grew in dense masses in 5 feet of water and on July 28-29 was in beginning anthesis.

Following Fernald, Mem. Gray Herb. **3** : 81-85 (1932) our specimens belong with the var. *typicus*. In Yukon the species was previously known from Dawson region only.

Potamogeton Richardsonii (Benn.) Rydb. in Bull. Torr. Bot. Cl. **32** : 599 (1905).

P. perfoliatus ssp. *Richardsonii* (Benn.) Hult., Fl. Al. and Yukon **1** : 102 (1941).

Whitehorse, in shallow water in Lewes River, flowering July 28-29, No. 10643; Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 764; alluvial flats along west bank of Nisutlin River, in ponds and sloughs, specimens with immature fruits on July 23-26, No. 10722; Rose-Lapie River pass, in ponds near headwaters of Rose River, No. 11890.

Common in most lakes along the Canol Road, where it is probably the most common *Potamogeton*. Specimens with immature fruit were noted late in July and near Sheldon Lake; in mid-August most of fruits had already been dropped. The species is new to the flora of Yukon.

Potamogeton strictifolius Benn. var. **rutiloides** Fern. in Mem. Gray Herb. **3** : 57-60 (1932) map, fig. 9.

Pelly River valley, in shallow water near the edge of a pond, No. 9874. The specimens in the above collections are young plants developed from last year's winter buds.

New to the flora of Yukon; the nearest northwestern stations are in Mackenzie Delta and on Great Bear Lake.

Potamogeton vaginatus Turcz. in Bull. Soc. Nat. Mosc. 66 (1854).

Rose-Lapie River pass, near headwaters of Lapie River, common in ponds and sluggish streams, No. 10587; Pelly River valley, rhizomes with sprouting tubers, June 15, No. 9638; same place, young plants in beginning anthesis from small muskeg pond, June 25, No. 9875; Ross River valley, pond near Mile 222, No. 11507; Ross River valley, Sheldon Lake, flowering specimens August 16, No. 11516.

Probably common in most lakes and sluggish streams. In Sheldon Lake the species grew abundantly in 4 to 5 feet of water and flowered on August 16. On a calm day a film of pollen, undoubtedly of this species, covered the waters of the lake. The species is new to the flora of Yukon; the nearest known stations are in Mackenzie Delta and on Great Bear Lake.

SCHEUCHZERIACEAE

Triglochin maritimum L., Hult., Fl. Al. and Yukon **1** : 105 (1941).

Whitehorse, edge of a pond, fruiting specimens on July 28–29, No. 10642; Pelly River valley, marshy lake shore south of Ross Post, flowering specimens, June 21, No. 9764.

The species was seen nowhere else and appears to be restricted to calcareous or alkaline soils.

Triglochin palustre L., Hult., Fl. Al. and Yukon **1** : 106 (1941).

Whitehorse, sandy river-banks, fruiting specimens, July 28-29, No. 10641; west bank of Nisutlin River, Mile 36-42, No. 10717; Pelly River valley, marshy edge of lake, flowering specimens, June 25, No. 9873.

The species was seen nowhere else and, like the preceding, appears to be restricted to calcareous or alkaline soil.

ALISMACEAE

Sagittaria cuneata Sheldon in Bull. Torr. Bot. Cl. **20** : 283 (1893).

Johnson Crossing, M. P. and R. T. Porsild, Nos. 546, 617, and 728, flowering specimens on July 19 and 20, and immature fruits on August 10. New to the flora of Yukon and only recently collected in Alaska, Alaska Highway, Mile 1250, Anderson and Brown, No. 10267. The nearest station in Mackenzie district is on Great Slave Lake (Raup, 1947).

GRAMINEAE

Phalaris arundinacea L. Sp. Pl. 55 (1753).

Whitehorse, Ear Lake, M.P. and R. T. Porsild, No. 24.

New to the flora of Yukon. The nearest known stations are Liard Hot Springs, Mackenzie River, and central Alaska.

Hierochloë alpina (Sw.) Roem. & Schult.; Hult., Fl. Al. and Yukon **2** : 132 (1942).

Lower Lapie River crossing, Mile 132, grassy summit of mountain south of road, No. 9600; same place, No. 9899.

The species was noted as common above timber-line everywhere from Mile 14 to Macmillan Pass. It was rarely seen at low altitude and then only on outwash plains (Mile 95). On Mount Sheldon it grew on the very summit at 7,200 feet elevation.

Hierochloë odorata (L.) Wahlenb.; Hult., Fl. Al. and Yukon **2** : 134 (1942).

Rose-Lapie River pass, Mile 105, near Lapie Lake, in a meadow, No. 9793; lower Lapie River, on gravelly river-flats, No. 9999; valley of the south fork of Macmillan River, gravelly river-bank, No. 11399.

Rare or occasional in meadows and on gravelly river-banks. Noted also from Nisutlin River, Mile 39, and from several places in the Rose-Lapie River pass.

Stipa columbiana Macoun; Hult., Fl. Al. and Yukon **2** : 136 (1942).
Whitehorse, Anderson, No. 9654.

Stipa comata Trin. & Rupr.; Hult., Fl. Al. and Yukon **2** : 136 (1942).

Whitehorse, roadsides, Anderson No. 9651. Also noted elsewhere as a recent introduction.

Stipa Richardsoni Link in Hort. Berol. **2** : 245 (1822).

Whitehorse, turfy places in a meadow east of Lewes River, No. 10646. Miles Canyon, Anderson, No. 9652. Also noted at Mile 893 on the Alaska Highway, between Whitehorse and Teslin Lake.

The collection represents a considerable extension of the known range of this species previously known from Saskatchewan, Colorado west to British Columbia, and north to the Wood Buffalo Park, Alberta.

Oryzopsis pungens (Torr.) Hitchc., Contr. U.S. Nat. Herb. **12** : 151 (1908).

Watson Lake, Anderson and Brown, No. 9923-A.

A considerable extension of the known range of this species, in the Northwest previously known from the upper Peace River (Raup, 1934) and from Bear and Slave Lakes.

Muhlenbergia Richardsonis (Trin.) Rydb. in Bull. Torr. Bot. Cl. **32**: 600 (1905).

Alaska Highway, Mile 988, west of Whitehorse, Anderson and Brown, No. 10329 (Can).

A notable extension of the known range of this species which, in the Northwest, was known only from Wood Buffalo Park (Raup) and Great Bear River (Porsild).

Phleum alpinum L., Sp. Pl. 59 (1753).

Ph. alpinum var. *americanum* Hult., Fl. Al. and Yukon **2** : 136 (1942).

Upper Rose River, Mile 95, gravelly river-flats and meadows, Nos. 10343 and 10536; Rose-Lapie River pass, Mile 98, alpine meadows near headwaters of Rose River, elevation 4,000 feet, No. 11893; south fork of Macmillan River, Mile 250, gravelly river-banks, No. 11396; upper south fork of Macmillan River, Mile 268, alpine meadow by a brook, elevation 4,500 feet, No. 11314.

A common species in alpine meadows, chiefly on Precambrian rocks, ascending to elevation of 5,600 feet at Mile 95. Noted also on Mount Sheldon and in Macmillan Pass.

Phleum pratense L.; Hult., Fl. Al. and Yukon **2**: 138 (1942).

Alluvial flats west of Nisutlin River near Mile 30 (Sydney Creek) in a meadow where horses had been grazed, No. 10723.

Our specimens are more than 100 cm. tall and were in anthesis on July 26. The species was noted in a number of other places along the Canol Road where horses had been wintered. In 1947 it was reported common everywhere along Alaska Highway, between Whitehorse and Johnson Crossing.

Alopecurus aequalis Sobol.; Hult., Fl. Al. and Yukon **2** : 139 (1942).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 526 and 726; alluvial flats west of Nisutlin River, near Mile 30 (Sydney Creek) in a meadow where horses had been grazed, fruiting specimens on July 26, No. 10724; lower Lapie River crossing, Mile 132, in a muskeg along "bulldozer" trail, No. 10027; Pelly River valley, south of Ross Post, in wet meadows and sloughs, No. 9846; northeast spur of Mount Sheldon, Mile 227, edge of pond in subalpine meadow, No. 11443.

Rare or occasional in wet meadows and on the edge of ponds and sloughs.

Alopecurus alpinus Sm. in Fl. Brit. **3** : 1386 (1804).

Macmillan Pass, Mackenzie-Yukon Divide, in wet places among willows, elevation 4,600 feet, No. 11192. In addition, a few specimens were collected east of Yukon-Mackenzie boundary. (*See* also Porsild, Nat. Mus., Canada, Bull. **101** : 15 (1945)).

Although not a littoral species, *A. alpinus*, as far as the writer is aware, otherwise has never been recorded at any considerable distance from the seashore.[1] The station in Macmillan Pass is more than 400 miles from the coast and thus constitutes a notable extension of the known range of this arctic, circumpolar, and otherwise coastal species.

Alopecurus glaucus Less.; Hult., Fl. Al. and Yukon **2** : 142 (1942).

A. occidentalis Scribn. & Tweedy.

Whitehorse, near Lewes River rapids, M. P. and R. T. Porsild, No. 3. In Yukon otherwise known from the Yukon River, Ranch Creek, and Fort Selkirk.

Polypogon monspeliensis (L.) Desf.; Hult., Fl. Al. and Yukon **2** : 144 (1942).

An introduced species in Yukon, recorded once from Dawson.

Arctagrostis arundinacea (Trin.) Beal., Grasses N. Am. **2** : 317 (1896).

A. latifolia var. *arundinacea* Hult., Fl. Al. and Yukon **2** : 145 (1942).

West bank of Nisutlin River, Mile 36-42, boggy places in open spruce forest, No. 10730; in a meadow near Mile 30 (Sydney Creek), Nos. 10727 and 10728; upper Rose River valley, Mile 95, in meadows on river-flat, No. 10532; lower Lapie River crossing, Mile 132, gravelly river-flats, Nos. 9974 and 9998; same place, No. 9958; south slope of Mount Sheldon opposite Mile 222, moist rocky ravines below timber-line, elevation 4,000 feet, No. 11705; upper south fork of Macmillan River, shaly mountain west of river opposite Mile 268, alpine meadow near snowflushes, elevation 4,000 feet, Nos. 11316 and 11317.

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[1] H. G. Simmons, Vascular Pl. Ellesmereland, p. 178, when he included Rocky Mountains in the range of *A. alpinus* obviously had in mind the quite distinct *A. glaucus* Less. (*A. occidentalis* Scribn. & Tweedy).

A common and somewhat variable species of alluvial river-flats and turfy places in open spruce forest; first noted in full anthesis on Lapie River on June 28. The anthers that in early anthesis are purple become yellow in age; in life they average about 2 mm. in length but in drying shrink considerably. In anthesis the flowering panicle is pyramidal, but later, and often in drying, the branches become erect and appressed to the main rhachis.

The first two numbers in the series belong to the poorly defined *A. angustifolia* Nash. (*A. latifolia* var. *angustifolia* (Nash) Hult.).

Arctagrostis latifolia (R. Br.) Griseb.; Hult., Fl. Al. and Yukon **2** : 145 (1942).

Lower Lapie River crossing, Mile 132, alpine summit of mountain south of road, elevation 5,600 feet, No. 9904. Also from mountains north of McQuesten River, Christie, Nos. 6 and 7; Kluane Lake, Burwash Landing, between 6,000 and 7,000 feet elevation, Clarke, No. 205; Kluane Lake, Anderson, No. 9391, and the Arctic Coast.

In our No. 9904, which is immature and not typical, the spikelets are large, but the glumes are thin and pale purplish. *A. latifolia* is common on the Arctic Coast but apparently is rare in the interior where it is probably always restricted to high mountains. In central Alaska it has been collected only once.

Arctagrostis poaeoides Nash.; Hult., Fl. Al. and Yukon **2** : 148 (1942).

West bank of Nisutlin River, Mile 36, in a wet meadow, No. 10729; lower Lapie River crossing, Mile 132, in rich poplar woods by a spring, No. 9559.

In separating these numbers from *A. arundinacea* the writer has followed Hultén's treatment in Fl. Alaska and Yukon, 144-148 (1942), although he questions that *A. poaeoides* should be maintained above varietal rank.

Thus, Nos. 10727 and 10728 (under *A. arundinacea*) growing in the same meadow could, according to Hultén's key, be placed either under *A. poaeoides* or *A. latifolia* var. *arundinacea.* In 10728 the panicle branches are very scabrous, the spikelets small and pale, and the anthers less than 1·5 mm. long. In 10727, almost smooth as well as scabrous panicle branches were seen in different panicles from the same root; also, some panicles had pale green spikelets, whereas others were dark purple.

Cinna latifolia (Trev.) Griseb. in Ledeb. Fl. Ross. **4** : 435 (1853).

This species thus far has not been recorded from Yukon but is common on the Pacific coast of Alaska and in northern British Columbia. It was recently collected near the Yukon border, at Liard Hot Springs, Anderson and Brown, No. 10365, and undoubtedly also occurs in southeast Yukon.

Agrostis borealis Hartm., Handb. Skand. Fl. ed. **3** : 17 (1838).

South slope of Mount Sheldon, Mile 222, steep rocky ravines below timber-line, elevation 4,000 feet, No. 11703; south fork of Macmillan River, gravelly river-banks near Mile 240, No. 11397.

The species was seen nowhere else and, although common locally on Mount Sheldon, appears to be rare in the region. It is known from the west and south coast of Alaska and from the Precambrian rocks of Northwest Territories but has not been recorded previously from Yukon; also it appears to be unknown in the interior of Alaska.

Agrostis scabra Willd.; Hult., Fl. Al. and Yukon **2** : 155 (1942).

In a meadow west of Nisutlin River, Mile 30, near Sydney Creek, No. 10726; Rose River valley, Mile 77, on shelving river-banks, No. 10244; upper Rose River valley, river-flats near Mile 95, No. 10341. Noted also on Mount Sheldon and on the south fork of Macmillan River.

A common species on alluvial flats in river valleys.

The long-awned var. *geminata* (Trin.) Hult. in the Northwest appears to be restricted to the Pacific Coast, and its only Yukon station known to the writer is at Whitehorse where it is limited to the townsite and, undoubtedly, introduced, although fully established. Macoun, Can, No. 54717.

Agrostis stolonifera L.; Hult., Fl. Al. and Yukon **2** : 157 (1942).

Introduced at Dawson where it was collected in a garden by Macoun in 1902 and, again, in 1916 by Malte, No. 156.

Calamagrostis canadensis (Michx.) Beauv.; Hult., Fl. Al. and Yukon **2** : 160 (1942).

Meadows west of Nisutlin River, Mile 30, near Sydney Creek, No. 10731; river-flats on upper Rose River, Mile 95, No. 10533; steep west slope of granite range east of upper Rose River, in meadow by a tiny brook, elevation 4,500 feet, No. 10485; northeast spur of Mount Sheldon, in subalpine meadows near road, Mile 226, Nos. 11448, 11450, and 11451; valley of the south fork of Macmillan River, Mile 250, where it is a dominant species in meadows, No. 11398; upper Macmillan River, shale mountain west of Mile 268 in open fir forest near timber-line, No. 11318; Macmillan Pass, Mackenzie-Yukon Divide, in a bog, No. 11201.

A common species in meadows and in open forest. In the rather uniform series listed above, the glumes are slightly longer than in the var. *typica* and, following Stebbin's treatment Rhod. 32 (1930), should be placed with var. *robusta* Vasey.

Calamagrostis canadensis var. **Langsdorffii** (Link) Inman in Rhod. 24 : 143 (1922).

C. canadensis ssp. *Langsdorffii* Hult., Fl. Al. and Yukon **2** : 161 (1942).

Steep west slope of granite range east of upper Rose River, opposite Mile 95, in alpine meadow by a brook, No. 10486; northwest spur of Itsi Range opposite Mile 250, on alpine slope above timber-line, No. 11380; upper south fork of Macmillan River, mountain slope west of Mile 268 in open fir forest near timber-line, No. 11319.

In the three numbers the glumes are 5 mm. long, rather narrow and long-acuminate, with a conspicuous and long pubescence on the entire back.

In the country adjacent to the Canol Road the var. *Langsdorffii* seems restricted to timber-line.

Hultén, in Flora of Alaska and Yukon, p. 161 (1942), has changed the status of the plant from that of variety to subspecies; inasmuch as Hultén himself assigns to his ssp. *Langsdorffii* the same geographical range as to *C. canadensis,* it would seem advisable to maintain the varietal status for this plant.

Calamagrostis canadensis (Michx.) Beauv. var.?

South shoulder of Mount Sheldon, Mile 218, timbered lower slopes in grassy places, No. 11655.

A peculiar variation of *C. canadensis* was very common on burnt-over slopes where it formed tall, firm tussocks. The leaves are flat and very scabrous; the culms 45 cm. high and scabrous; the panicle narrow and open, somewhat interrupted, about 10 cm. long and 1·0 to 1·5 cm. wide. The glumes are dark purple and glabrous except on the hispid keel, acuminate, and about 5 mm. long. The callus hairs are very numerous and of equal length, as long as the 4-toothed lemma. The awn is straight and is attached at the middle of the lemma. The specimens were collected on August 10; they were infertile and may be *A. canadensis* × *inexpansa.*

Calamagrostis chordorrhiza Porsild in Sargentia **4**: 9 (1943).

(Plate X, figures 1 and 2)

A remarkable and well-marked species, which thus far is known only from Mackenzie Delta, but which, undoubtedly, will be found also in northern Yukon.

By its small spikelets and small, straight awns, *C. chordorrhiza* may be related to *C. neglecta* (Ehrh.) Gaertn., though its very scabrous and glaucous leaves and strong rhizomes are somewhat suggestive of *C. purpurascens* R. Br.

Calamagrostis inexpansa A. Gray; Hult., Fl. Al. and Yukon **2** : 115 (1942).

Whitehorse on river terraces east of Lewes River, No. 10653; sandy, shelving river-banks west of Nisutlin River near Mile 36, No. 10735; Rose-Lapie River pass, Mile 102, in wet sand near Lapie Lake, No. 10592; lower Lapie River crossing, Mile 132, gravelly river-flats No. 9983.

A common species in sandy and gravelly places such as river-flats or lake shores. Not seen north of Pelly River.

Calamagrostis lapponica (Wahlenb.) Hartm. var. **nearctica** Porsild in Sargentia **4** : 10 (1943).

C. lapponica Hult., Fl. Al. and Yukon **2** : 166 (1942).

(Plate XI, figures 1 and 2)

Pass between Teslin and Nisutlin Rivers, Mile 14, in alpine meadow, No. 11021; grassy meadow west of Nisutlin River, Mile 30, near Sydney Creek, No. 10732; alluvial flats west of Nisutlin River, Nos. 10733 and 10734; north end of Sheldon Lake in a meadow, No. 11520; Mount Sheldon in subalpine meadows near Mile 226, No. 11449; upper south fork of Macmillan River, turfy summit of shale mountain west of Mile 268, elevation 6,000 feet, No. 11326; Macmillan Pass, Yukon-Mackenzie Divide, on mountain slope, elevation 5,000 feet, No. 11281; on gravel bars of upper Macmillan River, Mile 280, No. 11292.

A common species in meadows at low elevation but occasionally found to timber-line or above.

Calamagrostis neglecta (Ehrh.) Fl. d. Wett.; Hult., Fl. Al. and Yukon **2** : 167 (1942).

Whitehorse on river terraces east of Lewes River, No. 10652; on river-banks and alluvial flats west of Nisutlin River, No. 10736.

Rare or occasional in meadows and on river-flats and noted in the southern part of the region only.

Calamagrostis purpurascens R. Br.; Hult., Fl. Al. and Yukon **2** : 170 (1942).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 116; Rose-Lapie River pass, meadows and sandy slopes near headwaters of Lapie River, Mile 102, No. 10593; lower Lapie River crossing, gravelly river-flats, No. 9982. Noted also at Whitehorse, on the Nisutlin, and elsewhere north to Pelly River.

A common species in dry sandy and shaly soils derived from calcareous, non-igneous rocks. Not seen north of Pelly River.

Deschampsia brevifolia R. Br. in Suppl. App. Parry's 1st Voy., p. 291 (1824). For a discussion of the nomenclature *see* Fernald in Rhodora **36** : 90 (1934).

South fork of Macmillan River, Mile 240, on grassy river-banks, No. 11405; Macmillan Pass, Mackenzie-Yukon Divide, alpine tundra on river-flats, Nos. 11193, 11195, and 11198; same place, north side of pass in a small tributary valley, No. 11196.

The specimens in the present series are somewhat taller than material from arctic Canada and Greenland, with culms 20 to 30 cm. high; in tall specimens the panicle branches are somewhat spreading. The glumes and lemmas are about 3 mm. long and the anthers about 1 mm. long. The awn is short and straight and attached at, or slightly below, the middle of the lemma. Our specimens were past flowering and, apparently, all infertile. The material cannot be referred to *D. caespitosa* or to its var. *glauca* or ssp. *orientalis* (compare Hultén, Fl. Al. and Yukon, p. 176, 1942).

Common in alpine tundra on upper Macmillan River and in Macmillan Pass.

The known North American range of this species is northern east and west Greenland, islands in Hudson Bay, northern Baffin Island west through the Arctic Archipelago to the Arctic Coast at Cape Bathurst. So far as the writer is aware, the species has not previously been recorded away from the sea-coast.

Deschampsia caespitosa (L.) Beauv.; Hult., Fl. Al. and Yukon **2** : 175 (1942).

Whitehorse, in turfy places on river terraces east of Lewes River, No. 10648; river-banks on Nisutlin River, Mile 36-42, No. 10737; Rose-Lapie River pass, meadow and river-banks near headwaters of Lapie River, Mile 102, No. 10588; north end of Sheldon Lake, Mile 222, wet meadow, No. 11523.

A common species in meadows on river-flats in the southern part of the road. Observed only once north of Pelly River.

Deschampsia danthonioides (Trin.) Munro.; Hult., Fl. Al. and Yukon **2** : 179 (1942).

In Yukon collected a few times at Dawson where it was introduced.

Deschampsia elongata (Hook.) Munro.; Hult., Fl. Al. and Yukon **2** : 179 (1942).

In Yukon collected once along a railroad embankment at Whitehorse.

Vahlodea atropurpurea (Wahlenb.) Fr. ssp. **latifolia** (Hook.) Porsild n. comb.

Aira latifolia Hook., Fl. Bor. Am. **2** : 243 (1840) tab. 227.

Vahlodea atropurpurea ssp. *paramushirensis* Hult., Fl. Al. and Yukon **2** : 180 (1942).

South shoulder of Mount Sheldon opposite Mile 218, subalpine meadows on timbered lower slopes, elevation 4,500 feet, No. 11656; upper south fork of Macmillan River, shale mountain west of Mile 268, elevation 5,000 feet, in an alpine meadow, No. 11327. Also collected in Macmillan Pass east of Yukon-Mackenzie Divide, No. 11194.

The writer hesitates to follow Hultén who, in his Flora of Aleutian Islands, 82 (1937) and in Flora of Alaska and Yukon, l.c., has taken up for the western American plant ssp. *paramushirensis* (Kudo) Hult., Fl. Kamtchatka **1** : 111 (1927). According to Hultén, l.c., Kudo in Journ. Coll. Agr. Hokkaido Univ. Sapporo **11**, 2 : 71 (1922) described his variety as follows: "Culmi caespitosi. Folia utrinque pilis capillaribus curvatis albis dense obtecta", and Hultén himself describes the Kamtchatka plant as having "leaves densely white-haired on both sides."

The writer has seen no Asiatic material of ssp. *paramushirensis*, but in more than 50 sheets of *Vahlodea atropurpurea* from Alaska, Yukon, Alberta, and British Columbia, including two which by Hultén were referred to ssp. *paramushirensis*, no pubescence can be seen on the leaves under a 10-power lens. Furthermore, in his description of the Rocky Mountain plant Hooker, l.c., explicitly states: "foliis lato-linearibus acutis glabris."

There does not, then, appear to be any justification for Hultén's application of ssp. *paramushirensis* to the western American plant for which, moreover, a much older and valid name is available.

The ssp. *latifolia* is a western American race, distinguished from the plant of arctic Europe, Greenland, and eastern North America chiefly by its taller growth, its broader and longer basal and cauline leaves, and by the slightly shorter callus hairs. The above collections constitute a considerable extension of the known range of the ssp. *latifolia*.

Trisetum sibiricum Rupr.; Hult., Fl. Al. and Yukon **2** : 183 (1942).

In Yukon collected once in the Dawson district and twice on the Arctic Coast at King Point, Ostf. (1910) and Porsild (1943). The plant that occurs on the Arctic Coast is var. *litorale* Rupr. which Hultén, l.c., considers an arctic-montane race.

Trisetum spicatum (L.) Richt.; Hult., Fl. Al. and Yukon **2** : 184 (1942).

Rose-Lapie River pass in meadows and on grassy slopes near Mile 102, No. 10600; same place, in alpine meadow, No. 9792; southwest slope of granite mountain west of Mile 116, alpine slopes 5,000-foot elevation, No.

10050; lower Lapie River, gravelly river-flats, Mile 127, No. 10000; river-flats, Mile 132, No. 9975; south shoulder of Mount Sheldon, alpine timber-line fir forest, elevation 4,500 feet, No. 11585; valley of south fork of Macmillan River, Mile 240, in a meadow, No. 11395; upper south fork of Macmillan River, shale mountain west of Mile 268, in alpine meadow, No. 11315; Macmillan Pass, Yukon-Mackenzie Divide, in alpine tundra, Nos. 11199 and 11200.

Although somewhat variable as to degree of pilosity, as well as to density and colour of the panicle, the numbers in the present series are rather uniform. They can probably all be referred to the arctic-alpine var. *Maidenii* (Gand.) Fernald, which is the common *Trisetum* found everywhere throughout the territory on river-banks, on sandy and grassy or rocky places from the lowland to well above timber-line (at Mile 95, 105, 132, and 222, to 6,000-foot elevation).

The var. *molle* (Michx.) Piper was seen less commonly, usually in subalpine meadows and in recent burns:

East slope of Rose River valley, open pine forest near Mile 77, No. 10245; alpine meadow on granite mountain west of Mile 95, 5,600-foot elevation, No. 10545; lower slopes in a recent burn near Mile 92, No. 10468; Pelly River valley in open aspen forest, Mile 138, No. 9765; south shoulder of Mount Sheldon, Mile 218, in a recent burn, elevation 4,500 feet, No. 11658; northeast spur of Mount Sheldon; in subalpine meadows near road, Mile 226, No. 11442.

In the material listed under var. *molle*, the mature culms sometimes are 60 cm. high and almost smooth, even below the panicle which is open, somewhat interrupted, pale green when young, becoming straw-coloured in age.

The var. *pilosiglume* Fern. was not seen by the writer.

Avena sativa L., Sp. Pl. 79 (1753).

Sandy west shore of Sheldon Lake, near Mile 219, No. 11526.

Self-sown near a camp where horses were stabled during the preceding winter. On August 6 the culms were 90 cm. high with fully developed panicles just past flowering.

Danthonia intermedia Vasey in Bull. Torr. Bot. Cl. **10** : 52 (1883).

East slope of Rose River valley, Mile 77, in open pine woods, No. 11973; Rose-Lapie River pass, Mile 102, dry, grassy slopes, elevation 3,600 feet, No. 10590; steep west slope of granite range east of Rose River, Mile 95, dry, grassy slope, elevation 4,500 feet, No. 10487; northeast spur of Mount Sheldon, in subalpine meadows near road, Mile 226, No. 11445; southeast slope of Mount Sheldon on a dry, grassy slope near timber-line, elevation 5,000 feet, Nos. 11736 and 11735.

Danthonia intermedia was found only in dry subalpine meadows and always associated with other prairie species such as *Schizachne purpurascens*, *Carex praticola*, and *C. macloviana*. On Mount Sheldon the species reaches timber-line on the dry south slope where on August 11 the florets contained mature grains. The species in the Yukon tends to be more caespitose than is normally the case; thus No. 11735 formed dense and very firm tussocks that could not be broken up without the aid of a knife. In some tussocks were counted as many as 50 fruiting culms. The species is new to the flora of Yukon.

Beckmannia syzigachne (Steud.) Fern.; Hult., Fl. Al. and Yukon **2** : 188 (1942).

Pelly River valley near Mile 136 in wet places by shallow, alkaline lake, No. 11164.

The species apparently is rare and was not seen elsewhere.

Koeleria Cairnesiana Hult., Fl. Al. and Yukon **2** : 190 (1942) fig. 1b and fig. 2 g-i.

Known only from the type locality: "Between Aishihik Lake and headwaters of Nisling R.".

Koeleria yukonensis Hult., Fl. Al. and Yukon **2** : 190 (1942) fig. 1a and fig. 2d.

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 11976. Apparently a rare species previously known only from the type collection: "Yukon District."

Schizachne purpurascens (Torr.) Swallen in Journ. Wash. Acad. Sci. **18** : 204 (1928).

Steep west slope of granite range east of upper Rose River, Mile 95, on dry, grassy slope, elevation 4,500 feet, No. 10488; Rose-Lapie River pass, Mile 102, in subalpine meadows, No. 10591; northeast spur of Mount Sheldon, in subalpine meadows near the road at Mile 226, No. 11444.

Schizachne purpurascens is a rare species in southwestern Yukon where it appears to be restricted to a peculiar type of subalpine meadow or "relic" prairie where it was found associated with other prairie species such as *Danthonia intermedia* (*See* this). In No. 11444 the florets contained fully ripe grains on August 4. The species is new to the flora of Yukon. Its nearest known stations are Kenai Peninsula, Alaska, northern British Columbia, Great Bear Lake, and Lake Athabasca.

Poa alpigena (Fr.) Lindm.; Hult., Fl. Al. and Yukon **2** : 197 (1942).

Lower Lapie River crossing, Mile 132, gravelly river-flats, No. 9979; south and east slopes of Mount Sheldon, Mile 222, No. 11706; south shoulder of Sheldon, open fir forest of lower slopes, No. 11657; northeast spur of Mount Sheldon, subalpine meadows near Mile 226, No. 11454; south fork of Macmillan River, Mile 250, in a meadow by the river, No. 11401; upper south fork of Macmillan River, shale mountain west of Mile 268, No. 11323; Macmillan Pass, Mackenzie-Yukon Divide, in alpine tundra, No. 11186.

A common species of river valleys and lowland meadows rarely seen above timber-line. On Mount Sheldon and in Macmillan Pass noted in timber-line fir forest to 5,000-foot elevation.

Poa alpina L.; Hult., Fl. Al. and Yukon **2** : 198 (1942).

Upper Rose River, Mile 95, on gravel bars along river, No. 10537; Rose-Lapie Pass, Mile 105, in swampy spruce forest by lake, No. 9286; south and east slope of Mount Sheldon, Mile 222, in steep ravine near summit, elevation 6,000 feet, No. 11737; upper south fork of Macmillan River, outwash plain at Mile 280, No. 11287; Macmillan Pass, Mackenzie-Yukon Divide, alpine, treeless tundra, No. 11185.

A common species favouring moist, sandy or gravelly habitats of alpine valleys and slopes. On Mount Sheldon noted to 6,000-foot elevation. In Macmillan Pass flowering specimens were collected during the first week of September.

Poa ampla Merr.; Hult., Fl. Al. and Yukon **2** : 200 (1942).

In Yukon recorded from Whitehorse and Hootalinqua.

Poa annua L.; Hult., Fl. Al. and Yukon **2** : 200 (1942).

Common at Whitehorse and elsewhere near human habitation.

Poa arctica R. Br.; Hult., Fl. Al. and Yukon **2** : 201 (1942).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, No. 10972; same place, No. 11020; upper Rose River valley, Mile 95, gravelly outwash plain, No. 10432; granite range west of Rose River, Mile 95, in alpine meadows at 6,000-foot elevation, No. 10543; lower Lapie Crossing, grassy summit of mountain south of Mile 132, No. 9902; upper south fork of Macmillan River, shale mountain west of Mile 268, in turfy places on summit, elevation 6,000 feet, No. 11322; upper south fork of Macmillan River, gravel outwash plain near Mile 280, No. 11288; Macmillan Pass, Mackenzie-Yukon Divide, near headwaters of South Macmillan River, No. 11187.

Typical *Poa arctica* is common in southeastern Yukon where it was collected or noted at or above timber-line on all mountains climbed. On Mount Sheldon it grew on rocky ledges at the very summit at 7,200-foot elevation. It is common also on outwash plains and on river gravel bars near the headwaters of the rivers but was not observed in the lowland. Not previously recorded from the interior but common on the arctic coast of Yukon.

Poa Canbyi (Scribn.) Piper; Hult., Fl. Al. and Yukon **2** : 204 (1942).

Upper Rose River valley, sandbars in river-flat near Mile 95, elevation 3,600 feet, No. 10345.

This species, which in the Yukon has been collected only in a couple of stations in Yukon Valley, and on the Alaska Highway, Mile 970, Anderson and Brown, No. 10002, was seen nowhere else on Canol Road. Our specimens were in anthesis on July 11 and according to Mrs. A. Chase belong to the small northern form.

Poa compressa L.; Hult., Fl. Al. and Yukon **2**: 205 (1942).

An introduced species, in Yukon collected a few times at Bennett and Whitehorse.

Poa glauca M. Vahl; Hult., Fl. Al. and Yukon **2** : 208 (1942).

Rose River valley, gravelly river-banks and open pine woods, near Mile 77, No. 10243; upper Rose River, in old burns east of Mile 95, No. 10449; Rose-Lapie River pass, Mile 102, in open willow thickets by a stream, No. 10596; same place on dry, sandy hillside, No. 10594; Rose-Lapie pass, rocky slope of granite mountain west of Mile 116, Nos. 10051 and 10052; lower Lapie River, gravel bars opposite Mile 127, No. 10001; lower Lapie crossing, Mile 132, dry, gravelly river-banks, No. 9981; Pelly River, on alluvial plain near Ross River trading-post, No. 9687.

Poa glauca is a common species in dry, sandy, and gravelly places such as river-flats and gravel screes. It is often a dominant species in open *Betula glandulosa* thickets on valley bottoms, on the lower slopes, and in open spruce and pine forest. It is less common above timber-line. On dry ridges of the south slope of Mount Sheldon it was not seen above the 5,000-foot level but on a mountain south of Lapie Crossing reached 6,000 feet. Numbers 10051 and 10052 are alpine forms with low, arching culms.

A peculiar *Poa*, undoubtedly closely related to *P. glauca* and placed here tentatively, was found in abundance on dry sandy hillsides in the Rose-Lapie Pass, near Mile 102, No. 10595, and on dry, shaly bluffs east of the Lewes River, Whitehorse, No. 10655.

This plant, which is densely tufted and of the habit of *P. glauca*, differs by its almost smooth culms, narrow panicles, and pale, straw-coloured glumes and lemmas. The glumes are strongly keeled, more or less scabrous near the apex and are 3 mm. long; the lemmas are 2 mm. long, scabrous on the lower half of the keel, hirsute on the ribs, but not at all lanate; the anthers are 1·2 mm. long.

Poa lanata Scribn. & Merr.; Hult., Fl. Al. and Yukon **2** : 213 (1942).

Granite mountain range west up upper Rose River, opposite Mile 95, in alpine meadow, 5,600 feet, No. 10544; lower Lapie River crossing, on gravel bars in river-flat, Mile 132, No. 9980; south shoulder of Mount Sheldon, grassy slopes above timber-line, 4,500 feet, No. 11588; upper south fork of Macmillan River, on gravelly outwash plain opposite Mile 280, Nos. 11289 and 11290.

Poa lanata apparently is not uncommon on high mountains and on gravelly outwash plains near the headwaters of rivers along the Canol Road. It is a rather handsome species, at once distinguished from other *Poas* of this region by its short, broad and flat leaves, strong rhizomes, and dark purplish panicles and culms.

In Yukon the species was previously known from a single collection on Donjek River in southwestern Yukon.

Poa palustris L.; Hult., Fl. Al. and Yukon **2** : 218 (1942).

Alluvial flats west of Nisutlin River, Mile 42, No. 10742; wet meadows west of Nisutlin River, near Sydney Creek, Mile 30, No. 10740. Also from Dawson, Malte, August 10, 1916 (Can), and from Whitehorse, Anderson, No. 9555 (Can).

Poa palustris was seen nowhere else along the Canol Road and probably does not extend north beyond the lowlands of Nisutlin River.

Poa pratensis L., Sp. Pl. 67 (1753).

Meadows and river-flats along upper Rose River, Mile 95, No. 10344; same place, gravelly river bars, No. 10535; Rose-Lapie River pass, meadows near Rose Lake, Mile 102, No. 10597; lower Lapie River crossing, Mile 132, in a muskeg by the roadside, No. 10028, south fork of Macmillan River, meadows near Mile 248, No. 11400; same place, gravelly river-bank, No. 11404.

Poa pratensis is common on well-watered river meadows and on gravel bars of the valleys. On lower Lapie River it flowered on June 30. It is, undoubtedly, indigenous to southeast Yukon, although Hultén does not record it from Yukon and believes it was introduced into Alaska.

Poa paucispicula Scribn. & Merr. in Contr. U.S. Nat. Herb. **13** : 69 (1910). *See* Raup, Sargentia **6** : 114 (1947).

P. leptocoma Hult., Fl. Al. and Yukon **2** : 215 (1942).

Upper Rose River, gravelly outwash plain near Mile 95, No. 10431; granite mountain range west of Mile 95, in subalpine meadow by a stream, elevation 5,000 feet, No. 11920; south shoulder of Mount Sheldon, Mile 222, moist grassy slope where snow remained late, elevation 5,000 feet, No. 11587; same place, forming large, dense tussocks, by an alpine brook, No. 11586; valley of the south fork of Macmillan River, Mile 240, grassy river-bank, No. 11402; south fork of Macmillan River, shaly mountain west of Mile 268, in moist grassy places by a spring, No. 11324; same place, near a snowflush, No. 11325; Macmillan Pass, Mackenzie-Yukon Divide, alpine, treeless tundra, by a stream, No. 11974.

Poa paucispicula is a common species which is characteristic of alpine and timber-line meadows where it grows in moist but not boggy places by streams and near snowfields. At lower altitudes it is found only by mountain streams on outwash plains. It is always caespitose and forms firm, dense tussocks, sometimes 50 cm. in diameter. Although variable as to height of culm and breadth of leaves, the series is uniform. The anthers average 0·6 mm. in length. Number 11324 is 40 cm. tall with leaves 0·5 cm. wide.

Poa trivialis L.; Hult., Fl. Al. and Yukon **2** : 221 (1942).

In wet meadows on Sydney Creek, Mile 30, west of Nisutlin River, No. 10741.

Our specimens grew in a meadow where horses had been pastured the preceding winters. Imported hay obviously had been fed, from which a number of other non-indigenous species had grown. The specimens were 60 cm. tall and were past flowering on July 24.

Poa Williamsii Nash in Bull. N.Y. Bot. Gard., **2,** 6 : 156 (1901).

P. arctica ssp. *Williamsii* Hult., Fl. Al. and Yukon **2** : 202 (1942).

East side of Rose River valley, on alpine slope of granite mountain east of Mile 85-90, elevation 5,000 to 6,000 feet, No. 10159; lower Lapie River crossing, rocky ledges near summit of mountain south of Mile 132, 6,000 feet, No. 9903.

Hultén, l.c., distinguishes three races of *P. arctica,* each with a fairly well-defined geographical area. Thus, according to him, the main species is restricted to the western and northern sea-coast and to islands in Bering Sea and Strait; ssp. *longiculmis* Hult. occupies the shores of Norton Sound, Seward Peninsula, and Kotzebue Sound of western Alaska, but has a disjunct area in central Yukon, whereas, finally, ssp. *Williamsii* (Nash) Hult. is found in the Aleutian Islands and on the Pacific coast of Alaska with two stations in mountains of southern Yukon.

Inasmuch as the writer found typical *P. arctica* common on all high mountains in the interior of southeast Yukon, where also *P. Williamsii* was collected, it would seem preferable to consider the latter a distinct species rather than a geographical race. *P. Williamsii,* in southeast Yukon, is a late-flowering species which, on July 6 (No. 10159), had only reached anthesis when *P. arctica* on the same mountain had almost mature fruits.

Colpodium Wrightii Scribn. & Merr. in Contr. U.S. Nat. Herb. **13** : 74 (1910).

Poa Wrightii (Scribn. & Merr.) Hitch.

Macmillan Pass, Mackenzie-Yukon Divide, alpine, grassy slope, elevation 5,000 feet, near Mile 282, No. 11188.

A small colony of typical specimens with mature fruits was noted on August 31, near the east end of the pass in a creek bed where the snow had remained late. The species was seen nowhere else.

The present collection constitutes a considerable extension of the known range of this rare grass, which was previously known only from three stations on Seward Peninsula, west Alaska, and from the type locality on Arakamtchetchene Island, Chukch Peninsula, Siberia. A further report of *Colpodium Wrightii*, from Mount Crillon in southeast Alaska (Cooper, Bull. Torr. Bot. Cl. **66** : 455 (1939)), which is questioned by Hultén on phytogeographical grounds, needs to be reconsidered in the light of the present discovery. The species is new to the flora of Canada.

Arctophila fulva (Trin.) Anders.; Hult., Fl. Al. and Yukon **2** : 224 (1942).

Ross River valley, in a grassy slough near north end of Sheldon Lake, near Mile 222, No. 11522; northeast spur of Mount Sheldon, edge of pond in subalpine meadow near road, elevation 3,400 feet, near Mile 226, No. 11447.

In No. 11522 the plants are 75 cm. high with very large panicles and 5- to 6-flowered spikelets. Number 11447 is a much lower form with 3-flowered spikelets. It is in beginning anthesis on August 4 and probably does not mature fruits. Completely sterile specimens were noted in Macmillan Pass just east of Mackenzie-Yukon Divide. In Yukon otherwise known from the Dawson district and from the Arctic Coast.

Dupontia Fisheri R. Br. ssp. **psilosantha** (Rupr.) Hult., in Fl. Al. and Yukon **2** : 226 (1942).

Herschel Island, Can. Arct. Exp. No. 222; Shingle Point, Porsild, No. 7081.

Common in brackish meadows along the arctic sea-coast.

Glyceria borealis (Nash) Batch.; Hult., Fl. Al. and Yukon **2** : 228 (1942). In Yukon recorded only from Dawson District.

Glyceria grandis Wats. in Gray's Man. ed. 6, 667 (1890).

G. maxima ssp. *grandis* Hult., Fl. Al. and Yukon **2** : 229 (1942).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 532 and 605; also noted in a slough on Pelly River near Mile 141 at Ross trading-post. In Yukon known, besides, from Dawson district and from Mayo, Anderson, No. 9707.

Glyceria pulchella (Nash) K. Schum.; Hult., Fl. Al. and Yukon **2** : 232 (1942).

Ross River valley, in wet slough near north end of Sheldon Lake, Mile 22, No. 11521.

Our specimens were in anthesis on August 5 and the species probably does not mature fruits at Sheldon Lake. Probably a rare species along Canol Road.

Glyceria striata (Lam.) Hitchc. in Proc. Biol. Soc. Wash. 41: 157 (1928).

As in the case of several other species, *G. striata* is known from central Alaska and adjacent parts of British Columbia (Liard Hot Springs, A. E. Porsild, No. 9042) but, so far, has not been collected in Yukon.

Puccinellia arctica (Hook.) Fern. & Weath. in Rhod. **18** : 4 (1916).

Glyceria distans f. *arctica* Ostf., Gjöa Exp. 33 (1910).

Arctic Coast, Shingle Point along the seashore, Porsild, No. 7084; Herschel Island, Gjöa Expedition.

Puccinellia distans (L.) Parl., Fl. Ital. 367 (1848).

Whitehorse, M. P. Porsild, No. 114.

A common roadside weed along the Alaska Highway.

Puccinellia Nuttalliana (Schult.) Hitchc. in Jepson, Fl. Calif. **1** : 162 (1912).

Poa Nuttalliana Schult. Mant. **2** : 303 (1824).

Poa airoides Nutt.; Hook., Fl. Bor.-Am. **2** : 245 (1840).

Puccinellia tenuiflora (Grieseb.) Scribn. & Merr. in Contr. U.S. Nat. Herb. **13**, 3 : 78 (1910) Hult., Fl. Al. and Yukon **2** : 238 (1942).

Puccinellia hauptiana sensu Swallen Journ. Wash. Acad. Sci. 34, **1** : 18 (1944).

Puccinellia borealis Swallen, ibid., p. 19, at least in part.

Whitehorse, sandy river terraces, No. 10654; near airport, M. P. and R. T. Porsild, No. 114; Alaska Highway, Mile 937, Anderson and Brown, No. 9993; Kluane Lake, Burwash Landing, Clarke, No. 138; Bonanza Creek, Dawson, Eastwood, No. 443.

Our plant is perennial, densely caespitose with erect-ascending, glabrous, 40- to 50-cm.-high culms. The mature panicles are 15 cm. long, the branches scabrous, the lower 7 to 8 cm. long and more or less reflexed. The spikelets are 4- to 6-flowered, the lemmas scabrous along the keel, about 2 mm. long, and the anthers 0·5 to 0·6 mm. long.

Our plant is a close match for specimens from central interior Alaska exemplified by: Franklin, Fortymile district, Anderson and Gasser, No. 7253; Richardson Highway between Summit and McCarthy, A. E. and R. T. Porsild, No. 389; Alaska Highway, Mile 1292, Anderson, No. 9207; Wiseman, Anderson, No. 5797; Palmer, Anderson, No. 7027; Livengood, Anderson, No. 8980. In this series the Anderson specimens by Swallen have been referred either to *P. hauptiana* or to his *P. borealis*. The writer, however, is unable to distinguish the Alaska-Yukon plant from typical *P. Nuttalliana* and prefers to retain it under that name, especially since it antedates *P. tenuiflora*.

The type of *P. borealis* is Walpole, No. 2015, from Seward Peninsula, Port Clarence, but according to Swallen that species is found also in central Alaska and Yukon "mostly along rivers." The writer has not seen the type of *P. borealis*, but he finds it difficult to believe that the one and same species of *Puccinellia* occupies areas so climatically different as seashores of Bering Strait and river-banks of central Alaska and Yukon. *P. arctica* (Hook.) Fern. & Weath., on the other hand, is a common species on the Alaska shores of Bering Strait, and *P. borealis* Swallen of the sea-coast probably should be referred to it. Compare Porsild, Rhodora, **41** : 181 (1939).

Festuca altaica Trin.; Hult., Fl. Al. and Yukon **2** : 239 (1942).

East slope of Rose River valley, in open pine woods near Mile 77, No. 10242; meadows along upper Rose River, Mile 95, No. 10531; Rose-Lapie Pass, in subalpine meadows at road level, Mile 102, No. 9351; shale mountain on upper Macmillan River, opposite Mile 268, in subalpine fir forest, 5,000-foot elevation, No. 11321. In addition, noted from all other stations where plants were collected.

A common or often dominant species, in southeast Yukon occupying a wide variety of habitats, from the lowland to the highest peaks. Thus, on Mount Sheldon it was noted near the summit at 7,200-foot elevation. In Rose River valley the species was first observed in anthesis on July 3.

Festuca brachyphylla Schultes, Mant. **3** : 646 (1827).

Rocky summit of mountain south of Mile 132, lower Lapie River crossing, elevation 5,600 feet, No. 9900; south shoulder of Mount Sheldon, on rocky ledges above timber-line, elevation 5,600 feet, No. 11589; upper Macmillan River, turfy slope of mountain west of Mile 268, elevation 6,000 feet, No. 11320. Also noted on ledges at the summit of Mount Sheldon, 7,200-foot elevation, and on upper slopes of a mountain near west end of Macmillan Pass, Mile 282.

Hultén, Flora of Alaska and Yukon, p. 243, denies the presence of *F. brachyphylla* in central Alaska and Yukon, stating that its place here is taken by *F. saximontana* which he reduces to subspecific rank. Actually *F. brachyphylla*, as is the case with a number of other arctic-boreal species, is found on high mountains of the interior. Thus, the collections of *F. brachyphylla*, correctly reported by the writer, in Rhodora **41** : 181 (1939), from mountains of central Alaska (Castner Glacier, A. E. and R. T. Porsild, No. 464, and Kokrines Mountains, A. E. and R. T. Porsild, Nos. 696 and 699), are definitely not *F. saximontana*, as Hultén, l.c., suggests, although he had not examined the specimens.

Festuca elatior L., Sp. Pl. 75 (1753).

A roadside weed collected at Whitehorse by Anderson, No. 9655.

Festuca megalura Nutt. in Journ. Acad. Phila. **2, 1** : 188 (1848).

Vulpia megalura Hult., Fl. Al. and Yukon **2** : 248 (1942).

Collected in a garden at Dawson (Can, 54577).

Festuca rubra L., Sp. Pl. 74 (1753).

F. rubra ssp. *Richardsonii* (Hook.) Hult., Fl. Al. and Yukon **2** : 246 (1942).

Sandy west bank of Nisutlin River opposite Mile 42, No. 10738; meadows and river-flats of upper Rose River, Mile 95, No. 10342; lower Lapie River crossing, Mile 132, dry gravelly terraces, No. 9526.

The last number and also Porsild, Nos. 7121 and 7168 from the Arctic Coast are var. *arenaria* (Osb.) Fries.

Without stating his reasons for doing so, Hultén, l.c., as a subspecies of *F. rubra*, has taken up *F. Richardsonii* Hook., Fl. Bor.-Am. **2** : 250 (1840) tab. 230, the type of which came from the arctic sea-coast of the Mackenzie district. Although Gelert, in Ostenfeld, Fl. Arctica **1** : 130 (1902), erroneously placed this with *F. ovina* [*F. brachyphylla*], the description and the excellent plate clearly show Hooker's plant to be the circumpolar arctic-boreal *F. rubra* var. *arenaria* (Osb.) Fr., Fl. Hall. 28 (1817).

Festuca rubra and its var. *arenaria* both appear to be rare along the Canol Road where they were found only in the lowland.

Festuca saximontana Rydb. in Bull. Torr. Bot. Cl. **36** : 536 (1909).

F. brachyphylla ssp. *saximontana* Hultén, Fl. Al. and Yukon 242 (1942).

See also discussion under *F. brachyphylla.*

East slope of Rose River valley, Mile 77, open pine forest, No. 10241; upper Rose River, Mile 95, gravelly outwash plain, No. 10430; Rose-Lapie River pass, Mile 102, dry grassy slopes, Nos. 10599 and 9352; lower Lapie Crossing, Mile 132, gravelly river-flats, No. 9976; Mount Sheldon, steep ravines of the lower south slope opposite Mile 222, No. 11704.

Festuca saximontana is a common species on dry slopes and on river-flats from low to medium elevations but was seen nowhere at or above timber-line, nor was it seen north of Mount Sheldon, Mile 222.

Bromus Dudleyi Fern. in Rhodora **32** : 63 (1930), tab. 196, figs. 1–3.

Northeast spur of Mount Sheldon, in subalpine meadows near the road, Mile 226, elevation 3,400 feet, No. 11446.

The species was observed nowhere else and in the subalpine meadows at Mount Sheldon was associated with *Danthonia intermedia, Schizachne purpurascens, Carex atherodes,* and other species of a relic prairie flora.

Our plant is a good match for authentic material of *B. Dudleyi* in the National Herbarium of Canada and differs markedly from *B. ciliatus* by its purple- or bronze-tinged spikelets, its flattish glumes, and prominently purple-nerved glumes and lemmas. The anthers are very short, 0·6 to 1·0 mm. long. Our plant is caespitose; the culms are 120 cm. high with slightly nodding panicle and on August 4 had almost mature fruits.

A specimen in the National Herbarium from Mount Selwyn, B.C. (Raup and Abbe, No. 4160) distributed as *B. Richardsonii,* undoubtedly is referable to *B. Dudleyi,* as is a sheet from Good Hope on the lower Mackenzie, Taylor, July 18, 1892 (Can, 30070).

The species is new to Yukon and Northwest Territories but by Fernald, l.c., was recorded from Newfoundland west to British Columbia.

Bromus inermis Leyss., Fl. Hal. 16 (1761).

Whitehorse, edge of woods near airport, M. P. and R. T. Porsild, No. 118; meadows west of Nisutlin River, near Sydney Creek, Mile 30, No. 10743.

The species grew in a meadow where horses had been pastured the preceding winters and, undoubtedly, is introduced.

Bromus Pumpellianus Scribn. var. **arcticus** (Shear) A. E. Porsild in Rhod. **41** : 182 (1939); Hult., Fl. Al. and Yukon **2** : 251 (1942).

Rose-Lapie River pass, sandy slopes of glacial drumlins near Mile 102, No. 10598; lower Lapie River crossing, Mile 132, lower slopes of shale mountains, No. 9455; same place, gravelly river-flats, June 28, Nos. 9978 and 9977.

The specimen in the last number has very short rhizomes and formed large, compact tussocks; the glumes are almost glabrous and the branches of the panicle 3·4 cm. long. It thus approaches typical *B. Pumpellianus* Scribn.

Bromus Pumpellianus var. *arcticus* is common at low altitudes in sandy places on the Lapie River in soils derived from Palæozoic rocks. It was not observed north of Pelly River.

Bromus racemosus L.; Hult., Fl. Al. and Yukon **2** : 253 (1942).

An introduced species, collected a few times near Dawson.

Bromus tectorum L., Sp. Pl. 77 (1753).

Introduced at Dawson where it was collected by Malte, No. 165.

Lolium multiflorum Lam.; Hult., Fl. Al. and Yukon **2** : 254 (1942).

An introduced weed recorded once, from Dawson district.

Lolium temulentum L.; Hult., Fl. Al. and Yukon **2** : 255 (1942).

An introduced weed recorded once, from Dawson district.

Agropyron alaskanum Scribn. & Merr. in Contr., U.S. Nat. Herb. **13**, 3 : 85 (1910).

Lower Lapie River crossing, summit of mountains south of Mile 132, elevation 5,600 feet, No. 9901. The writer has seen no authentic material but follows Hultén, Fl. Al. and Yukon, p. 256, in referring the above collection to *A. alaskanum*, chiefly because of the appressed hirsute nodes and minutely scabrous lemmas. Otherwise the specimens are suggestive of *A. latiglume*, to which species, certainly, the plant cited by Macoun and Holm, Rept., Can. Arct. Exp. **5** : 8A (1921) and by Hultén, l.c., from Cape Bathurst belongs.

Agropyron angustiglume Nevski in Bull. Jard. Bot. Acad. Sc. U.R.S.S. **30** : 615 (1932); Hult., Fl. Al. and Yukon **2** : 257 (1942).

A. violaceum β virescens Lange, Consp. Fl. Groenl. 155 (1880).

Rose-Lapie River pass, Mile 102, grassy slopes near headwaters of Lapie River, No. 10589; Macmillan Pass, Mackenzie-Yukon Divide, in subalpine meadows, Nos. 11189 and 11190.

Apparently a rare species thus far collected only once before in the Yukon.

Agropyron cristatum (L.) Gaertn. in Nov. Comm. Petrop. **14** : 540 (1773).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 497 and 712. A recent introduction noted by the collectors as common elsewhere, too, along the Alaska Highway. It was not noted by us in 1944.

Agropyron dasystachyum (Hook.) Scribn.; Scribn. & Merr., Contr. U.S. Nat. Herb. **13**, 3 : 85 (1910).

Whitehorse, on sandy and shaly bluffs east of Lewes River, Nos. 10651 and 11975; lower Lapie River crossing, on dry, shaly slopes of mountain west of Mile 132, elevation 5,000 feet, Nos. 9705 and 9706.

Hultén, l.c., denies that *A. dasystachyum* occurs in Alaska and Yukon and refers *A. dasystachyum* of Scribner & Merrill, l.c., to *A. sericeum* Hitchc.

in Am. Journ. Bot. **2** : 309 (1915). The writer has not seen the material referred to by Scribner & Merrill, but there can be no doubt that *A. dasystachyum* is actually found in Alaska and Yukon. The specimens in the writer's collection are a good match for the large series in the National Herbarium from western Canada and also match the description given by Scribner & Merrill, l.c. They all differ from *A. yukonense* by their glabrous glumes, densely villous lemmas, 4 to 5 mm. long anthers, and very glaucous leaves and haulms.

Number 10651, from Whitehorse, has long-awned lemmas and thus approaches *A. dasystachyum* var. *albicans* Scribn. & Smith.

Agropyron latiglume (Scribn. & Smith) Rydb.; Hult., Fl. Al. and Yukon **2** : 258 (1942).

Northeast shoulder of Mount Sheldon, near Mile 222, on dry mountain slope above timber-line, elevation 5,000 feet, No. 11059; upper south fork of Macmillan River, gravel outwash plain opposite Mile 280, No. 11291.

Typical *A. latiglume* in Yukon apparently is a rare, alpine species, which was not observed by us elsewhere. The plant recorded from Whitehorse and elsewhere in Yukon Valley (*See* Hultén, l.c.), and of which there is a large series before me, is not typical. It should probably be referred to *A. latiglume* ssp. *subalpinum* (Neum.) Holmb., or to *A. angustiglume.*

Agropyron sericeum Hitchc.; Hult., Fl. Al. and Yukon **2** : 260 (1942).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 527; lower Lapie River, on gravelly river-flat near Mile 127, Nos. 9996 and 9997; Pelly River valley, in sandy soil by an alkaline lake, Mile 138, No. 11166.

A lowland species which along Canol Road apparently is restricted to calcareous alluvial soils of Pelly River valley.

Agropyron spicatum (Pursh) Scribn. & Merr.; Hult., Fl. Al. and Yukon **2** : 261 (1942).

Known in Yukon from several stations in the Yukon Valley but not seen by us along Canol Road.

Agropyron subsecundum (Link) Hitchc. in Am. Journ. of Bot. **21** : 131 (1934); Hult., Fl. Al. and Yukon **2**: 261 (1942).

A. trachycaulum var. *unilaterale* Malte in Ann. Rept., Nat. Mus., Canada, 1930, p. 46 (1932).

Whitehorse, on sandy and shaly river terraces east of Lewes River, No. 10650; shelving west bank of Nisutlin River near Mile 36, No. 10745; Pelly River valley, sandy river terrace in open aspen woods, Mile 138, No. 11167.

Occasional to common on calcareous alluvial soils north to Pelly River.

Agropyron trachycaulum (Link) Malte in Ann. Rept., Nat. Mus., Canada, 1930, p. 42 (1932); Hult., Fl. Al. and Yukon **2** : 262 (1942).

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 10649; alluvial flats west of Nisutlin River, Mile 36, in open spruce woods, No. 10746; same place, on shelving river-banks, No. 10747; upper Rose

River, Mile 95, gravelly river-flats and meadows, No. 10534; Pelly River valley, dry sandy hillsides, Mile 138, No. 11165; northeast spur of Mount Sheldon, subalpine meadows near Mile 226, Nos. 11452 and 11453.

The specimens in the present series are rather uniform with essentially awnless and glabrous lemmas, glabrous and smooth sheaths, and are *A. trachycaulum* var. *tenerum* sensu Malte, l.c. One exception is No. 11165, which has retrorsely scabrous sheaths and very rough leaves.

The species is common to abundant on alluvial soils of the lowland north to Mount Sheldon.

Agropyron teslinense Porsild & Senn n.sp.

Caespitosum rhizomate brevi ascendente modice robusto. Folia basalia plana, 4 mm. lata, aetate involuta, culmorum longitudine dimidia. Culmi extravaginales subgeniculati, ad 100 cm alti, robusti, rigidi, laeves vel inferne et in vaginis parum retrorso-scabri et colore purpureo suffusi. Spicae graciles continuae neque interruptae, 15 cm longae, purpurascentes, rachide laevi spiculis paucifloribus. Glumae 7 mm longae rigidae truncatae nervis scabris prominentibus 3 ad 5. Lemmata 9 mm longa, laevia et glabra, obscure 5-nervia quasi mutica. Antherae 1·5 mm longae.

Johnson Crossing, Mile 0, north end of Teslin Lake, M. P. and R. T. Porsild, No. 710; west bank of Nisutlin River, near Mile 36, on steep, south-facing slopes of stiff clay, No. 10744 (type).

Our specimens had fully mature grains on July 26.

Following Scribner & Merrill, l.c., this is closest to *A. tenerum* Vasey (or *A. pauciflorum* (Schwein.) Hitch., Man. of Grasses of U.S., p. 237), which Hultén, l.c., includes in his *A. trachycaulum* (Link) Malte, (*sine emend.*). Our No. 10744, however, differs so markedly from the rather uniform series listed here under the latter name that the writer hesitates to place it there. It was seen nowhere else along Canol Road.

Agropyron teslinense has been cultivated at Ottawa by Dr. H. A. Senn, Experimental Farm, Division of Botany, who reports as follows: "Somatic chromosome counts on root tip material have consistently shown 2n = 28. Studies of pollen mother cells indicated normal meiosis. There were 14 bivalents at diakinesis and both first and second divisions were regular with no chromosome bridges, lagging chromosomes or fragments. Normal pollen grains were formed with no supernumerary micronuclei. These observations yield no indication of hybridity."

Experimental data from cultivated plants show the species to be self-fertile as is the case in *A. trachycaulum* (Link) Malte.

Agropyron yukonense Scribn. & Merr.; Hult., Fl. Al. and Yukon **2** : 263 (1942).

In Yukon collected a number of times at Whitehorse, Macintosh, and at Kluane Lake.

Triticum aestivum L., Sp. Pl. 85 (1753).

Sandy west shore of Sheldon Lake, near Mile 219, No. 11524.

The species, which was self-sown near an abandoned camp, on August 6 had well-formed but quite immature grains. It grew here with oats and barley and had done remarkably well, considering that the habitat had been inundated during the early part of the summer.

Hordeum brachyantherum Nevski; Hult., Fl. Al. and Yukon **2** : 265 (1942).

In Yukon recorded from Bennett and from Dawson.

Hordeum jubatum L.; Hult., Fl., Al. and Yukon **2** : 266 (1942).

Whitehorse, on sandy and shaly bluffs east of Lewes River, No. 10647; Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 401 and 713, meadows west of Nisutlin River, along Sydney Creek, Mile 30, No. 10725. Common on river-banks of the lowland and rapidly spreading along roads.

Hordeum vulgare L., Sp. Pl. 84 (1753).

Sandy west shore of Sheldon Lake, near Mile 219, No. 11525.

Self-sown near abandoned camp with *Avena sativa* and *Triticum aestivum* (*See* this). With almost fully matured grains on August 6.

Elymus arenarius L. ssp. **mollis** (Trin.) Hult.; Hult., Fl. Al. and Yukon **2** : 268 (1942).

Common along the arctic sea-coast but not recorded from elsewhere in the territory.

Elymus innovatus Beal; Hult., Fl. Al. and Yukon **2** : 273 (1942).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 503, 553, and 708.

In Yukon previously recorded from Dawson district. It was not seen by us elsewhere on Canol Road.

Elymus glaucus Buckl. in Proc. Acad. Nat. Sci. Phil. 1862 (1863) p. 99.

Dawson, August 16, 1916, Malte, No. 181. The collection, which is typical, constitutes the first record from Yukon. In Alaska known from the eastern Pacific coast north to Skagway.

Elymus Macounii Vasey; Hult., Fl. Al. and Yukon **2** : 273 (1942).

In Yukon recorded from Hootalinqua on Yukon River, and from Mayo. It was recently collected also at Mile 937 on the Alaska Highway by Anderson and Brown, No. 9994.

CYPERACEAE

Eriophorum angustifolium Roth.; Hult., Fl. Al. and Yukon **2** : 276 (1942).

Granite mountain range west of Rose River, Mile 95, in wet places by a brook, elevation 5,000 feet, No. 11923; lower Lapie River crossing, Mile 132, wet places in a muskeg, No. 9560; alpine slopes of mountain south of Mile 132, elevation 5,000 feet, No. 9906; Macmillan Pass, Yukon-Mackenzie Divide, in a bog, No. 11217.

A common species in muskegs and in alpine bogs; on Mount Sheldon noted to 5,600-foot elevation.

Eriophorum brachyantherum Trautv., Fl. Ochot. phaenog. **1**, 2 : 98 (1856); Hult., Fl. Al. and Yukon **2** : 279 (1942).

E. opacum (Björnstr.) Fernald.

Pass between Teslin and Nisutlin Rivers, Mile 14, elevation 4,000 feet, No. 11130; lower Lapie River crossing, Mile 132, in muskeg, No. 9534; same place, in open spruce woods, No. 9262; south shoulder of Mount Sheldon, Mile 219, wet bog in saddle toward Mount Riddell, No. 11668; south fork of Macmillan River, Mile 250, in black spruce muskeg, No. 11411.

Eriophorum brachyantherum is a common or even dominant species in black spruce muskegs of southeastern Yukon where it appears to take the place of *E. vaginatum*, so common to the west and north. It flowers very early, much earlier than in the Mackenzie where it is a late-flowering species, and on June 17 had almost mature achenes at Lapie Crossing.

It is restricted to moderate and low altitudes and was not seen above the 4,000-foot elevation.

Eriophorum callitrix Cham. in Mey. in Mém. Acad. Sci. St. Petersb. **1**: 203 (1831).

An arctic species of rather spotty distribution which in North America is known from some thirty stations from East Greenland to Alaska and which undoubtedly will be found on high mountains of northern Yukon and possibly on the Arctic Coast.

Eriophorum russeolum Fr. apud Hartm., Handb. Skand. Fl. 13 (1838).

In the National Herbarium is a specimen of typical *E. russeolum* labelled Keno, Mayo district, June 20-28, 1927, collected by Mrs. Geo. Black.

Eriophorum russeolum Fr. apud Hartm. var. **leucothrix** (Blomgr.) Hult. in Fl. Al. and Yukon **2** : 283 (1942).

Granite mountain range west of upper Rose River opposite Mile 95, subalpine meadow, in west moss by a brook, elevation 5,000 feet, No. 11922; gravel bars in lower Lapie River, Mile 127, No. 10002; northeast shoulder of Mount Sheldon, Mile 222, on boggy shore of alpine lake, elevation 5,000 feet, Nos. 11060 and 11061.

The numbers in above series are intermediate between *E. russeolum* var. *leucothrix* and *E. Scheuchzeri*. The heads are not globular but distinctly obovate, with bristles varying from yellowish white to distinctly plumbaceous (in 11922) and with scales having a rather broad translucent margin. The anthers, on the other hand, are very small, in life measuring 1 mm. in length. Our plant flowered later than *E. Scheuchzeri* but apparently was fertile. Typical *E. russeolum* and *E. medium* were not seen along the Canol Road. New to the flora of Yukon.

Eriophorum Scheuchzeri Hoppe; Hult., Fl. Al. and Yukon **2** : 284 (1942).

Pass between Teslin and Nisutlin Rivers, Mile 14, No. 11022; upper Rose River, Mile 95, gravelly river-flats, No. 10346; northwest end of Itsi Range, opposite Mile 250, alpine slopes, No. 11381.

A common species in wet places on alluvial soils at low and moderate elevations; on Mount Sheldon noted to 5,000 feet elevation.

Eriophorum vaginatum L.; Hult., Fl. Al. and Yukon **2** : 286 (1942).

It is strange that this species, which in the Yukon is common along the Arctic Coast besides being known from a number of stations along the

Yukon and its tributaries, was not seen by us anywhere along the Canol Road until we had crossed the Mackenzie-Yukon Divide.

Scirpus americanus Pers., Syn. **1**: 68 (1805).

A species of distinctly southern range which in the Northwest, thus far, is known only from a single, disjunct station at Circle Hot Springs, Alaska. It is not known in the Mackenzie drainage but may turn up somewhere in Yukon.

Scirpus caespitosus L. ssp. **austriacus** (Palla) Aschers. & Graebn.

S. caespitosus L. var. *callosus* Big.

Pass between Teslin and Nisutlin Rivers, Mile 14, in wet alpine bog, 5,000 feet elevation, No. 11023; east slope of Rose River valley, in a pine bog, Mile 77, No. 10246; granite mountain range west of upper Rose River, Mile 95, subalpine meadows and bogs near timber-line, elevation 5,000 feet, No. 11921; south shoulder of Mount Sheldon, Mile 219, in a bog in saddle between Sheldon and Mount Riddell, elevation 4,300 feet, No. 11669; northeast spur of Mount Sheldon, in a bog near Mile 226, No. 11455. Also noted on Itsi Mountain, Mile 250.

Common to occasional in cold, wet bogs, usually near timber-line. The above collections constitute the first records from Yukon.

Scirpus hudsonianus (Michx.) Fernald in Rhod. **8** : 161 (1906).

Eriophorum alpinum L.

East slope of Rose River valley near Mile 77, in wet places in a pine bog, No. 10247.

A rare species of very peculiar and disrupted range. Its nearest known stations are in the Alaska Range, Alaska, Revelstoke, B.C., and Great Slave Lake. It is new to the flora of Yukon.

Scirpus validus Vahl, Enumer. Pl. **2** : 268 (1806).

Pelly Valley, in a marly lake near Mile 136, Nos. 9639 and 9766.

This species was seen only once growing in a shallow lake in a marshy, spruce-covered plain. It was abundant here and formed a broad fringe around the mile-long lake, growing in deep mud in 12 to 18 inches of water. The species was in flower when first seen, on June 15, and last year had fruited well.

Scirpus validus has a peculiar and disrupted distribution in northwest America, where it was known previously from Cook Inlet, upper Tanana River, and southeastern Alaska, and from Great Bear River to Great Slave Lake, N.W.T. It is new to the flora of Yukon.

Eleocharis acicularis (L.) R. & S., Syst. **2** : 154 (1817).

Scirpus acicularis Hult., Fl. Al. and Yukon **2** : 289 (1942).

Whitehorse, shallow place in Lewes River, No. 10656; Rose-Lapie River pass, in shallow ponds near headwaters of Rose River, Mile 98-99, elevation 4,000 feet, No. 11894; Ross River valley, in shallow lake near Mile 204, No. 11528; Sheldon Lake, in shallow water not far from trading-post, Mile 219, No. 11529.

Eleocharis acicularis is probably common in all lakes in southeastern Yukon wherever suitable bottom conditions exist. Our specimens are all sterile and belong to var. *submersa* (Hj. Nilss.) Svenson. In the last number, collected on August 16, fully developed winter buds are present at the end of the filiform rhizomes.

Eleocharis palustris (L) R. & S., Syst. **2** : 151 (1817).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 451 and 452; marshy flat west of Nisutlin River, Mile 36, edge of shallow pond, No. 10748; lower Lapie River crossing, Mile 132, in a bog, No. 9535; Pelly Valley, Mile 136, in a muskeg pond south of Ross Post, No. 9876.

Rare to occasional in ponds and sloughs in the lowland. On Pelly River the species flowered on June 16 and on Nisutlin River had fully mature achenes on July 25.

The species is new to the flora of Yukon but has been recorded from Alaska and from Great Bear Lake.

Eleocharis pauciflora (Lightf.) Link, in Hort. Berol **1** : 284 (1827).

Mayo district, McArthur Range, Hot Springs, Bostock, No. 153; Whitehorse in marly bog east of Lewes River, No. 10657.

Our specimens differ from typical *E. pauciflora* by their shiny, greenish brown achenes, averaging 2·7 × 1·0 mm. Svenson, Rhod. **36** : 380 (1934) has called attention to certain consistent differences between European and North American *E. pauciflora*, including that the achenes in the former are "usually shiny." In the dozen or so specimens of European *E. pauciflora* in the National Herbarium of Canada, none have achenes that are as shiny or as dark coloured as in ours. Dr. H. K. Svenson, who has kindly examined No. 10657, thinks that it belongs to the western var. *Suksdorfiana* (Beauverd) Svenson, of mountain meadows of Washington and Oregon.

Eleocharis pauciflora is new to the flora of Yukon and has not been recorded from Alaska. Its nearest known stations are at Liard Hot Springs, northern B. C., A. E. Porsild, No. 9046, Great Bear Lake, Great Slave Lake, and southern British Columbia.

Eleocharis uniglumis (Link) Schultes, Mant. **2** : 88 (1824).

Whitehorse, M. P. and R. T. Porsild, No. 104; Upper Rose River valley, Mile 95, in wet sand on river-flat, No. 10472.

Our specimens were in beginning anthesis on July 23. The species is new to the flora of Yukon and in the Northwest was previously known only from a single station each in central Alaska and the Athabasca Lake region.

Kobresia Bellardi (All.) Degl. in Loisel. Fl. Gall. 626 (1807).

K. myosuroides Hult., Fl. Al. and Yukon **2** : 296 (1942).

Pass between Teslin and Nisutlin Rivers, Mile 14, alpine summit of granite mountain, elevation 6,000 feet, No. 10973; Rose-Lapie River pass, granite-schist mountain west of Mile 118, alpine rocky slope, elevation 5,000 feet, No. 10107; lower Lapie River crossing, rocky summit of mountain south of Mile 132, elevation 5,600 feet, No. 9905; lower Lapie River, dry river terraces below Mile 132, No. 9984.

Apparently a rare species in the Yukon where, otherwise, it has been collected on Kluane Lake and on the Arctic Coast, Porsild, No. 7123. In southeastern Yukon it is an alpine species, seen only once below timber-line.

Kobresia hyperborea n. nomen.

K. arctica Porsild in Sargentia **4** : 15 (1943), not *K. arctica* Ivanova in Journ. Bot. U.R.S.S. **24** : 490 (1939).

(Plate XII, figures 3–5)

Arctic coast of Yukon between King Point and Kay Point, in dry tundra, A. E. Porsild, No. 7125.

A very well-marked species which is perhaps most closely related to *K. macrocarpa* Clokey of alpine peaks of Colorado.

Kobresia hyperborea appears to be endemic to arctic northwestern Canada, having thus far been recorded from the Alaska-Yukon boundary east to Backs River, 64° 30′ N. and 104° W.

Kobresia simpliciuscula (Wahlenb.) Mack. in Bull. Torr. Bot. Cl. **50** : 349 (1923).

Pelly River valley, Mile 136, in turfy places near the margin of small marly pond, No. 9877.

Kobresia simpliciuscula apparently is a rare plant in Alaska and Yukon where it is restricted to certain types of calcareous soils; it is new to the flora of Yukon, but it is very common on the Palæozoic rocks east of the Mackenzie-Yukon Divide.

Carex nardina Fr. in Mant. **2** : 55 (1839).

Rose-Lapie River pass, windswept rocky ridge near summit of mountain east of Mile 105, elevation 5,000 feet, No. 10882; southwest slope of granite mountain west of Mile 116, elevation 6,000 feet, No. 10053; schist mountain, Mile 118, on a gravel slide, 5,500-foot elevation, No. 10109; same place, dry, grassy slope, elevation 4,500 feet, No. 10110; lower Lapie River crossing, stony ledges near summit of mountain south of Mile 132, elevation 6,000 feet, No. 9909.

Carex nardina appears to be a rare species in southeastern Yukon where it is restricted to alpine summits of Precambrian mountains of the dry belt south of Pelly Valley.

For a discussion of *C. nardina* and its var. *Hepburnii*, see Porsild, in Sargentia, 4 : 15-17 (1943). The variety *Hepburnii*, which apparently is an edaphic vicariad restricted to calcareous soils, was collected on the Palæozoic rocks of the east slope of Mackenzie Mountains. *C. nardina* is new to the flora of Yukon.

Carex capitata L.; Hult., Fl. Al. and Yukon **2** : 300 (1942).

Whitehorse, Lewes River, M. P. and R. T. Porsild, Nos. 5 and 101; alluvial flats west of Nisutlin River, Mile 36, boggy places in open spruce woods, No. 10758; east slope of Rose River near Mile 77, boggy places in pine forest, No. 10257.

In southeastern Yukon apparently a rare lowland species.

Carex capitata L. s. str., in North America extends through Alaska and Yukon over Bear Lake to James Bay and the east coast of Hudson Bay, south through the Canadian Cordillera, with isolated stations southward to northern Mexico. It is a decided calciphile which is boreal-alpine rather than arctic and does not extend beyond the limit of trees.

The plant that in the East has passed as *C. capitata* has recently been separated as an amphiatlantic race, *C. arctogena* H. Smith (Acta Phytogeogr. Suec. **13** : 191-200 (1940)). It is of decidedly arctic range and not a pronounced calciphile. In North America its range includes East and West Greenland to approximate latitude 72 degrees North, southern Baffin Island, northern Ungava and the Labrador coast, with isolated stations in northern Newfoundland, Gaspé, and New Hampshire. According to Smith, l.c., *C. arctogena* also occurs in Tierra del Fuego and southern Patagonia, whereas *S. capitata* is said to occur disjunctly in West Greenland, Newfoundland, and New Hampshire. The latter claim, the writer has been unable to corroborate.

Carex anthoxanthea Presl.; Hult., Fl. Al. and Yukon **2** : 206 (1942).

In Yukon recorded once from Whitehorse.

Carex maritima Gunn.; Hult., Fl. and Yukon **2** : 313 (1942), in part.

C. incurva Lightf.

In Yukon known from a single station on the Arctic Coast.

Carex incurviformis Mack. in Ryd.; Fl. Rocky Mts. 120 (1917).

C. maritima Hult., Fl. Al. and Yukon **2** : 313 (1942), in part.

South end of Kluane Lake, Anderson, No. 9369. *Carex maritima* reported by Hultén, l.c., from the Yukon Valley probably also belongs here, as do specimens from the interior of Alaska, e.g. Alaska Range, Lignite, A. E. and R. T. Porsild, No. 285.

Carex pyrenaica Wahlenb. in Sv. Vet.-Akad. Nya Handl. **24** : 139 (1803).

Pass between Teslin and Nisutlin Rivers, alpine summit of mountain east of Mile 14, No. 10975; same place, No. 11028; Rose River valley, alpine slopes of mountain east of Mile 77, No. 10939; upper Rose River valley, Mile 95, gravel bars in river, No. 10348; same place, gravelly outwash plain, No. 10434; south shoulder of Mount Sheldon, Mile 219, in glacial cirque above timber-line, elevation 6,000 feet, No. 11592; northeast shoulder of Mount Sheldon, elevation 6,000 feet, No. 11062; upper south fork of Macmillan River, shale mountain west of Mile 268, alpine slopes above timber-line, No. 11334; Macmillan Pass, Mackenzie-Yukon Divide, steep alpine slope near east end of pass, elevation 6,000 feet, No. 11280.

Carex pyrenaica is a common species in southeastern Yukon inhabiting moist slopes near névés, shaded ravines, and chimneys of north slopes, or frost-activated, stone-paved shores of glacial lakes. In such places it is often the dominant species and forms large, compact tussocks. Near the edge of the névés it may remain sterile for several years. In No. 10348 the achenes were fully mature and had started to drop July 11.

The large series in our collection is uniform and is inseparable from typical *C. pyrenaica* of the southern Canadian Cordillera. On the Pacific coast of Alaska and in the Aleutian Islands is a closely related species, *C. micropoda,* which differs from *C. pyrenaica* by having 2 stigmas, smaller perigynia, and broader leaves. Hultén, Fl. of Al. and Yukon, p. 308 (1942), who has seen no typical *C. pyrenaica* from Yukon or Alaska, considers the coast plant a geographical race, *C. pyrenaica* ssp. *micropoda* (C. A. Mey) Hult. In his discussion, Hultén, l.c., states that, although *C. micropoda* is well separated from "specimens [of *C. pyrenaica*] from more southern stations in America," the distinguishing characters tend to break down when compared with European material. The discovery, in Yukon, of typical *C. pyrenaica,* inseparable from material from stations in southern Alberta and British Columbia, strongly suggests that the plant of the Pacific Coast is actually a distinct species, as maintained by Mackenzie, N. Am. Fl. **18** : 28 (1931).

The species is new to the flora of Yukon.

Carex stenophylla Wahlenb. ssp. **Eleocharis** (Bail.) Hult., Fl. Al. and Yukon **2** : 314 (1942).

Whitehorse, sandy and shaly bluffs east of Lewes River, Nos. 9135 and 9137. Also Kluane Lake, Burwash Landing, Clarke, No. 145.

A rare species apparently restricted to the dry interior lowland of the upper Yukon and Kluane Lake area.

Carex praegracilis Boott; Hult., Fl. Al. and Yukon **2** : 315 (1942).

Whitehorse, Lewes River, flowering specimens on June 20, M. P. and R. T. Porsild. In Yukon previously known from a single collection from Dawson (Eastwood). In National Herbarium also from Liard Hot Springs (Clarke, No. 48).

Carex siccata Dew. in Am. Journ. Sci. **10** : 278 (1826).

Alaska Highway, junction with Haines Road, in natural prairies, Clarke, No. 308. New to the flora of Yukon.

Carex diandra Schrank; Hult., Fl. Al. and Yukon **2** : 316 (1942).

Whitehorse, in a bog east of Lewes River, No. 11979; alluvial flats west of Nisutlin River, in a wet bog, near Mile 42, No. 10754.

The species was seen nowhere else and in Yukon apparently is restricted to lowland stations. Our specimens had mature fruits on July 26.

Carex disperma Dew.; Hult., Fl. Al. and Yukon **2** : 327 (1942).

Alluvial flats west of Nisutlin River, Mile 39, in boggy places in open spruce woods, No. 10759; same place in a muskeg bog, No. 11977; lower Lapie River crossing, Mile 132, wet places in a muskeg, Nos. 9531 and 10030; lower, muskeg-covered, south slope of Mount Sheldon, Mile 222, No. 11761.

Rare or occasional in lowland muskeg forest, on Mount Sheldon to 3,000-foot elevation.

Carex tenuiflora Wahlenb.; Hult., Fl. Al. and Yukon **2** : 328 (1942).

South shoulder of Mount Sheldon, Mile 219, in wet bog in saddle toward Mount Riddell, elevation 4,300 feet, No. 11660; south fork of Macmillan River, Mile 250, wet places in a black spruce muskeg, No. 11406.

The species, apparently, is not common in southeastern Yukon.

Carex loliacea L.; Hult., Fl. Al. and Yukon **2** : 328 (1942).

Alluvial flats west of Nisutlin River, Mile 39, in sphagnum bog in a muskeg, No. 10755; east slope of Rose River valley, Mile 77, wet mossy places in a pine bog, No. 10263.

Apparently a rare species which was noticed only twice; in both places in wet boggy muskeg associated with *Carex disperma*. Previously known in Yukon only from a few stations near Yukon River close to the Alaska boundary. Our two new stations bridge the large gap between the central Alaska population and the nearest Canadian stations to the east, on Lake Athabasca.

Carex ursina Dew. in Am. Journ. Sci. **27** : 240 (1835).

Arctic Coast, Shingle Point, Porsild, No. 7085.

A high-arctic, littoral species thus far collected only once in Yukon.

Carex Lachenalii Schk.; Hult., Fl. Al. and Yukon **2** : 320 (1942).

Pass between Teslin and Nisutlin Rivers, slopes of mountain east of Mile 14, Nos. 10974 and 11031; same place, edge of meadow below large snowfield, elevation 5,500 feet, No. 11024; granite mountain range west of upper Rose River, Mile 95, rocky alpine slope near large snowfield, 5,000-foot elevation, No. 10197; same place, rocky ledges near summit, elevation 6,700 feet, No. 11924; same place, in an alpine meadow, 5,600-foot elevation, No. 10550; Rose-Lapie River pass, summit of schist mountain east of Mile 105, No. 10881; northeast shoulder of Mount Sheldon, Mile 222, in a glacial cirque near snowfield, No. 11063; upper south fork of Macmillan River, shale mountain west of Mile 268, in open alpine fir forest near timber-line, No. 11329; same place, alpine slope near 5,500-foot elevation, No. 11331; upper south fork of Macmillan River, in a gravel outwash plain near Mile 282, No. 11296. Noted in Macmillan Pass and Arctic Coast, Shingle Point, Porsild, No. 7084.

Carex Lachenalii in southeast Yukon is a common species of alpine slopes and, as a rule, is not found below timber-line. It prefers turfy places near the edge of perennial snowdrifts.

The last three numbers belong to a very robust form, distinguished by a strong tendency toward aphyllopodic culms and distinctly larger and prominently nerved perigynia with longer beaks.

Carex glareosa Wahlenb. var. **amphigena** Fern. in Rhod. **8** : 47 (1906).
C. marina Dew.

Arctic Coast, Shingle Point, Porsild, No. 7086. A littoral species which in Yukon is limited to the coast.

Carex neurochlaena Holm; Hult., Fl. Al. and Yukon **2** : 322 (1942).
See also Porsild, Sargentia **4** : 18 (1943).

In Yukon known from the type locality only (Rink Rapids).

Carex brunnescens (Pers.) Poir. in Lam. Encycl. Suppl. **3** : 286 (1813).

Pass between Teslin and Nisutlin Rivers, Mile 14, in a bog, No. 11029; east slope of Rose River valley, Mile 77, in a pine bog, Nos. 10258 and 10262; upper Rose River, Mile 95, in grassy places on river-flat, No. 10349;

upper Rose River, Mile 98-99, in a wet bog, No. 11896; south slope of Mount Sheldon, Mile 222, in a steep ravine near timber-line, No. 11711; northeast spur of Sheldon, in subalpine meadow by the road, Mile 226, No. 11458; south shoulder of Mount Sheldon, grassy slope above timber-line, elevation 4,500 feet, No. 11590; valley of the south fork of Macmillan River, Mile 240, in a meadow, Nos. 11407 and 11408; upper south fork of Macmillan River, shale mountain west of Mile 268, No. 11328; upper south fork of Macmillan River, outwash plain near Mile 280, No. 11295.

A common lowland species inhabiting a variety of habitats but most commonly found in wet meadows. It is rarely found above timber-line and on Mount Sheldon reached 4,500 feet.

Number 10349, from the upper Rose River, is a curious form that may represent a separate race distinguished by its densely caespitose growth, 2 mm. broad, flat or slightly revolute leaves, which are much shorter than the stiff, 25 cm. high culms that are scabrous only below the short, almost capitate, inflorescence which is composed of 3 to 4 few-flowered gynaecandrous spikelets. Pistillate scales are shorter than the perigynia and white-hyaline margined, with a green mid-vein; the perigynia are golden brown, distinctly nerved dorsally, with a well-developed, almost smooth, somewhat bent, entire beak. This plant was common locally but seen nowhere else. It was fully fertile and had almost mature achenes on July 11.

Carex brunnescens does not appear to have been collected in Yukon previously.

Carex bonanzensis Britt.; Hult., Fl. Al. and Yukon **2** : 325 (1942).

Meadows west of Nisutlin River near Sydney Creek, Mile 30, No. 10750; flat west of Nisutlin River, Mile 39, on marshy edge of pond, No. 10756.

A lowland species seen only in the southern part of the road. Both collections had mature achenes on July 23.

Carex canescens L., Sp. Pl. 974 (1753).

Pass between Teslin and Nisutlin Rivers in subalpine meadow, Mile 10, No. 11133; east slope of Rose River valley, boggy pine woods, Mile 77, No. 10265; lower Lapie River crossing, Mile 132, in a muskeg by roadside, No. 9533; south shoulder of Mount Sheldon, Mile 219, in a wet flat, No. 11667; Ross River valley, in a wet meadow by north end of Sheldon Lake, Mile 222, No. 11530.

The two numbers below may be *C. canescens* x *Lachenalii.* In both, the perigynia are empty, as are those of last year; the leaves are broad with revolute margins: Pass between Teslin and Nisutlin Rivers, Mile 14, alpine meadow, elevation 5,000 feet, No. 11027; Macmillan Pass, Mackenzie-Yukon Divide, Mile 284, in a bog, No. 11216.

Carex canescens is a common species in wet meadows of the lowland; on Mount Sheldon it was noted to 4,200 feet elevation. The species is new to the flora of Yukon.

Carex lapponica O. F. Lang; Hult., Fl. Al. and Yukon **2** : 325 (1942).

C. canescens var. *subloliacea* Laest.

South shoulder of Mount Sheldon, Mile 219, in a wet flat No. 11659; valley of the south fork of Macmillan River, Mile 240, in a wet sphagnum bog, No. 11409.

Both numbers grew in sphagnum bogs and differ from *C. canescens* by their single culms and smooth-beaked perigynia.

Carex arcta Boott in Ill. Carex 155 (1867).

Johnson Crossing, Mile 0, in a river meadow, M. P. and R. T. Porsild, Nos. 404 and 608; Ross River valley, in a wet river meadow near north end of Sheldon Lake, near Mile 222, No. 11533; northeast spur of Mount Sheldon, in wet subalpine meadows or prairies near Mile 226, No. 11459.

The species was fairly common where found, but was seen nowhere else. It grew in wet alluvial soil near the edge of a slough where it formed large, dense tussocks. On August 5 some spikes had mature achenes, whereas others were in beginning anthesis.

The present collections greatly extend the known range of this rare species; its nearest stations are in the Wood Buffalo Park, Alta., and in Fraser Valley, B. C. *Carex arcta* belongs in that group of relic prairie species which is peculiar to the subalpine meadows near Mount Sheldon.

Carex gynocrates Wormskj. apud Drejer in Rev. Crit. p. 16 (1841); Hult., Fl. Al. and Yukon **2** : 302 (1942).

Whitehorse, Miles Canyon, M. P. and R. T. Porsild, Nos. 97 and 163; east slope of Rose River valley, Mile 77, in a sphagnum bog, No. 10251; Rose-Lapie River pass, ponds near headwaters of Rose River, Mile 98-99, elevation 4,000 feet, No. 11895; lower Lapie River, Mile 127, on wet, sandy river-flat, No. 10003; Pelly River valley, Mile 136, wet, marshy lake shore, No. 9879; same place in a bog, No. 9767; south shoulder of Mount Sheldon, Mile 219, in a wet bog, elevation 4,200 feet, No. 11666.

Although Hultén, l.c., states that "in no case have I seen male flowers at the top of the female spikes in the Alaskan material," androgynous spikes are present in more than half of the writer's material of *C. gynocrates* from Alaska and Yukon; and in 118 sheets of North American *C. gynocrates* in the National Herbarium of Canada, 70 contain some plants with androgynous spikes, and the remainder are dioecious. This is in complete agreement with Drejer's description which calls for: "Spicis oblongis polygamis (aliis mere femineis, aliis androgynis apice v. medio masculis)."

Carex gynocrates in Yukon is restricted to a distinctive type of bog on calcareous soil, where it is often associated with *Scirpus caespitosus* and *Tofieldia pusilla*. For this reason its distribution is spotty and discontinuous. In the Pelly Valley, specimens had mature achenes on June 21.

Carex interior Bailey in Bull. Torr. Bot. Cl. **20** : 426 (1893).

Thus far not recorded from Yukon but recently collected near the southern boundary, at Liard Hot Springs, B.C., Porsild, No. 9049.

Carex Deweyana Schw. in Ann. Lyc. N.Y. **1**: 65 (1824).

Like the preceding, collected at Liard Hot Springs, B.C., Anderson and Brown, No. 9869, but as yet not recorded from Yukon.

Carex macloviana d'Urv. in Mém. Soc. Linn. Paris **4** : 599 (1826).

Pass between Teslin and Nisutlin Rivers, Mile 14, in a subalpine meadow, No. 11132; alluvial flats west of Nisutlin River in natural prairies, Mile 36, No. 10763; Rose River valley, alpine slopes west of Mile 77, No. 10941; same place in meadows below timber-line, No. 10259; upper Rose River, Mile 95, in subalpine meadows by the river, No. 10351; Ross River valley, in subalpine meadows near Sheldon Lake, Mile 222, No. 11531; northeast spur of Mount Sheldon, subalpine meadows near Mile 226, No. 11457; Macmillan Pass, Mackenzie-Yukon Divide, treeless tundra, No. 11207.

In southeastern Yukon, *C. macloviana* is a common species in subalpine meadows where it is associated with *Danthonia intermedia*, *Schizachne purpurascens*, *Carex praticola*, *C. aenea*, and other prairie species. It was rarely seen outside the dry meadow association and ascends only to timber-line. The species is new to the flora of Yukon but in this region was known from northern British Columbia and from central Alaska, and from mountains west of the Mackenzie Delta east to Great Bear Lake.

Carex praticola Rydb.; Hult., Fl. Al. and Yukon **2** : 319 (1942).

Whitehorse, Miles Canyon, M. P. and R. T. Porsild, No. 57; Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 420 and 501; prairie-like meadows on alluvial flat west of Nisutlin River, Mile 36, No. 10764; in a wet meadow near Sydney Creek, west of Nisutlin River, Mile 30, No. 10749; Quiet Lake, Mile 55-60, open places on wooded slope, No. 11109; Rose-Lapie River pass, subalpine meadows near headwaters of Lapie River, Mile 105, No. 10601; lower Lapie River crossing, dry, grassy lower slopes of mountain west of Mile 132, No. 9863; Ross River valley near north end of Sheldon Lake, subalpine meadows near Mile 219, No. 11532. In No. 10764 the achenes were ripe on July 23.

Common to occasional in subalpine meadows or prairies of low elevations but seen nowhere else. Often associated with the preceding species. (*See* this.)

Carex aenea Fernald; Hult., Fl. Al. and Yukon **2** : 320 (1942).

Southeast slope of Mount Sheldon, Mile 222, dry subalpine meadows below timber-line, elevation 4,500 feet, No. 11710; south slope, elevation 5,000 feet, No. 11760; upper south fork of Macmillan River, shaly mountain west of Mile 268, in subalpine meadows near timber-line, No. 11332; upper south fork of Macmillan River, steep rocky scree, Mile 282, elevation 5,000 feet, No. 11282.

Locally common in dry subalpine meadows of mountain slopes along the Ross and Macmillan Rivers where it ascends to timber-line or slightly above. On Mount Sheldon our specimens (No. 11710) had mature achenes on August 17. In Yukon previously known from Dawson district.

Carex sychnocephala Carey in Am. Journ. Sci. II, **4** : 24 (1847).

Lower Lapie River crossing, by a moose-lick on the forested lower slopes of mountain west of Mile 132, No. 9425.

Our specimens were low and quite immature on June 12; judging from last year's fruiting heads it does not fruit well. *C. sychnocephala* belongs with the group of prairie species that in southeast Yukon are restricted to certain subalpine meadows and are considered relics of formerly more extensive grassland.

The species is new to the flora of Yukon; its nearest known stations are in the Wood Buffalo Park, Alberta, and Kamloops, B.C.

Carex leptalea Wahlenb. in Sv. Vet.-Akad. Nya Hand. **24** : 139 (1803).

In a muskeg flat west of Nisutlin River, Mile 42, No. 10757; Rose River valley, in sphagnum bog in pine forest near Mile 77, No. 10248; Rose-Lapie River pass, in a bog near headwaters of Rose River, Mile 98-99, elevation 4,000 feet, No. 11897; south shoulder of Mount Sheldon, Mile 219, in a calcareous bog in the saddle, elevation 4,300 feet, No. 11661.

Occasional in bogs of moderate elevation, ascending to timber-line on Mount Sheldon. New to the flora of Yukon.

Carex filifolia Nutt.; Hult., Fl. Al. and Yukon **2** : 304 (1942).

Whitehorse, dry sandy bluffs east of Lewes River, Nos. 9132-3; Rose-Lapie River pass, granite-schist mountain east of Mile 118, on dry, rocky ridge, 5,500-foot elevation, No. 10114; lower Lapie River crossing, lower slope of shaly mountain west of Mile 132, Nos. 9432, 9457, and 9707.

Carex filifolia is a dominant species on mountain slopes on Palæozoic rocks of the northern end of Pelly Mountains where it grows on extremely dry, sunny south slopes, from 3,500- to 5,000-foot elevation, forming large, firm cushions that are often annular due to the plant dying off from the centre. The plant appears to be a favourite food of mountain sheep, and its immature achenes furnish food for chipmunks. Number 9707, collected on June 20, has mature achenes.

Hultén, l.c., suggests that this species in Yukon belongs with "other prairie relicts such as *Stipa* and *Koeleria*." This is hardly the case because *C. filifolia* is a Cordilleran foothill species which, in the light of recent collections, cannot be considered a relic species in the Yukon where its occurrence is restricted by its special soil requirements rather than by climatic or historic causes. In the Northwest previously known from a single collection from Whitehorse and from upper Mackenzie Valley, at Wrigley, A. E. Porsild, No. 16657.

Carex obtusata Liljebl.; Hult., Fl. Al. and Yukon **2** : 305 (1942).

Whitehorse, sandy bluffs east of Lewes River, Nos. 9134 and 9136; Rose-Lapie River pass, dry, grassy slopes near headwaters of Lapie River No. 10608; lower Lapie River crossing, dry, shaly lower slopes of mountain west of Mile 132, No. 9458.

The species is common on dry, sandy slopes in Pelly Valley and on Lewes River east of Whitehorse and has been recorded also from Dawson district. It appears to be restricted to soils derived from the Palæozoic rocks.

Carex supina Willd. ex Wahlenb. ssp. **spaniocarpa** (Steud.) Hult., Fl. Al. and Yukon **2** : 365 (1942).

Pass between Teslin and Nisutlin Rivers, summit of granite mountain east of Mile 14, elevation 6,000 feet, No. 10978; Rose-Lapie River pass, dry, steep slopes of sandhills near headwaters of Lapie River, Nos. 9353 and 9354. Also collected on Haines Road near boundary, M. P. and R. T. Porsild, No. 162.

Carex supina ssp. *spaniocarpa* appears to be rare in southeast Yukon where it was seen only in the places mentioned, although equally suitable places were not wanting. Our stations fill in a gap between central Alaska and stations in the Mackenzie Delta and on Great Bear Lake. It is new to the flora of Yukon.

Carex Peckii Howe; Hult., Fl. Al. and Yukon **2** : 364 (1942).

In the Yukon recorded once, from Dawson.

Carex deflexa Hornem. in Dansk Oecon. Plantel. ed. 3, **1** : 938 (1821).

Pass between Teslin and Nisutlin Rivers, treeless, alpine meadows near Mile 14, No. 11131; upper Rose River, gravelly erosion fan near Mile 95, No. 10433; upper Rose River, Mile 92, common in fire clearing, No. 10347; south and east slopes of Mount Sheldon, Mile 222, on dry, grassy slope at 3,500-foot elevation, No. 11707; northeast spur of Mount Sheldon, Mile 226, clearings in fire-killed spruce forest, No. 11456; Macmillan Pass, Mackenzie-Yukon Divide, steep cherty scree above timber-line, Mile 282, No. 11284.

Carex deflexa is a common species on rather dry, open slopes where it is often a pioneer species following fire. On upper Rose River, at Mile 92, the species was particularly well developed on a hillside where the original spruce forest had been destroyed by fire about 10 years ago. It appears to be restricted to Precambrian rocks and is new to the flora of Yukon.

Carex Rossii Boott; Hult., Fl. Al. and Yukon **2** : 364 (1942).

Whitehorse, airport, M. P. and R. T. Porsild, Nos. 52 and 119; ibid. Miles Canyon, idem, No. 58; pass between Teslin and Nisutlin Rivers, No. 11982; subalpine slopes of mountain east of Mile 77, No. 10942; Rose-Lapie River pass, dry slopes of glacial drumlins near headwaters of Lapie River, Mile 102, No. 10604; lower Lapie River crossing, upper dry, shaly slopes of mountain west of Mile 132, elevation 5,000 feet, Nos. 9434 and 9456.

Apparently restricted to Palæozoic rocks and their sediments, and particularly common on dry, sunny south slopes in the northern part of Pelly Range where it ascends to 5,000 feet. In such places it flowers very early; thus our No. 9434 had matured fruits on June 12. In Yukon previously recorded from Dawson district.

Carex scirpoidea Michx.; Hult., Fl. Al. and Yukon **2** : 303 (1942).

Rose-Lapie River pass, near Lapie Lake, Mile 105, in a spruce swamp, Nos. 9290 and 9288; same place on rocky summit of schist mountain, elevation 6,000 feet, No. 9388; same place, in subalpine meadow, No. 9796; east slope of granite-schist mountain west of Mile 118, elevation 5,000 feet, No. 10108; lower Lapie River crossing, upper slopes of mountain south of Mile 132, No. 11981; lower Lapie River crossing, open, dry spruce woods, Nos. 9263 and 9561; south and east slope of Mount Sheldon, steep ravines near timber-line, elevation 5,000 feet, No. 11708.

A common and even ubiquitous species noted or collected in all places along the Canol Road where plants were collected. The species ascends to well above timber-line and on Mount Sheldon was noted to 7,200 feet. Mackenzie, N. Am. Fl. **18**, 4 : 207 (1935) suggests that *C. scirpoidea* is restricted to "calcareous districts." Although the species favours lime, it grows very well on acid Precambrian rocks, a fact which is amply borne out by its wide distribution in Greenland, Ungava, and northern Canada, across the Laurentian Shield.

Carex stenochlaena (Holm) Mackenzie in N. Am. Fl. **18** : 208 (1935).

C. scirpoidea var. *stenochlaena* Holm.

C. scirpoidea Hult., Fl. Al. and Yukon **2** : 303-4 (1942), in part.

Lower Lapie River crossing, grassy upper slope of mountain south of Mile 132, elevation 5,000 feet, No. 9911.

Our plant formed large firm tussocks with fertile culms 30 to 35 cm. high. The spikes are about 2·5 cm. long, somewhat clavellate, single, or with from 1 to 3 small lateral spikes issuing from the base of the supporting leaf-like bract. Although the spikes are essentially pistillate, nearly all have a few staminate flowers at the top. Otherwise the plant agrees well with the type from Chilliwack Lake, B.C. (Can, 33728), and, like it, has lanceolate, strongly flattened perigynia. In the several colonies examined, not a single entirely staminate plant could be found.

The species, which is new to the flora of Yukon, is known otherwise from southeastern Alaska, British Columbia, Alberta south to Idaho, and Washington.

Carex concinna R. Br.; Hult., Fl. Al. and Yukon **2** : 365 (1942).

Whitehorse, turfy places in open spruce woods east of Lewes River, No. 9131; Rose-Lapie River pass, Mile 105, in a spruce swamp, No. 9287; lower Lapie River, gravelly river-flats near Mile 127, No. 10008; lower Lapie River crossing, by the edge of a bog, Mile 132, No. 10029; same place, common in open spruce woods, Nos. 9265 and 9501; open spruce woods on moist north slope of mountain west of Mile 132, elevation 5,000 feet, No. 9433.

A pronounced calciphile, common on Palæozoic rocks at Whitehorse and in the northern part of Pelly Range but not observed north of Pelly River.

At Lapie Crossing the species had matured fruits on June 12.

Carex rupestris All.; Hult., Fl. Al. and Yukon **2** : 304 (1942).

Pass between Teslin and Nisutlin Rivers, rocky summit of granite mountain east of Mile 14, elevation 6,000 feet, No. 10977; Rose-Lapie River pass, granite-schist mountain east of Mile 118, rocky slope near 5,500-foot elevation, No. 10111; lower Lapie River crossing, dry rocky ledges of summit of mountain south of Mile 132, elevation 6,000 feet, No. 9910.

Carex rupestris is a very rare species in southeastern Yukon where it was found only three times, and always sparingly, on the summits of high mountains. From the Alaska-Yukon region it was previously known only from a single station each, on Seward Peninsula and in southeastern Alaska, and from two stations on the arctic coast of Yukon.

Carex glacialis Mack.; Hult., Fl. Al. and Yukon **2** : 366 (1942).

Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, an alpine scree at 5,500-foot elevation, No. 10112.

A rare species in the Alaska-Yukon region where it is known only from a few high-alpine stations.

Carex eburnea Boott in Hook. Fl. Bor.-Am. **2** : 226 (1840).

Alaska Highway, White River, Anderson, No. 9276. A pronounced calciphile not heretofore recorded from Yukon but which, in the Northwest, is known from Chitina River, Alaska, and from a number of places in the Mackenzie Mountains north to Mackenzie Delta.

Carex bicolor All., Fl. Ped. **2** : 267 (1785).

Upper Rose River, gravelly river-flats near Mile 95, No. 10350; Rose-Lapie River pass, in subalpine meadow near Lapie Lakes, Mile 111, No. 9794; lower Lapie River, gravelly river-flat near Mile 127, No. 10006.

Apparently a rare species noted only from three stations in the Rose-Lapie Divide. The species is new to the flora of Yukon but was previously known from adjacent southeastern Alaska.

Carex Garberi Fernald var. **bifaria** Fernald, in Rhod., **37** : 255 (1935); Hult., Fl. Al. and Yukon **2** : 333 (1942).

Alluvial banks of Nisutlin River, Mile 36, No. 10766; Rose River valley, in a pine bog near Mile 77, No. 10253; Rose-Lapie River pass, subalpine meadows near headwaters of Lapie River, Mile 102, No. 10602; lower Lapie River, gravelly river-flats near Mile 127, No. 10005; lower Lapie River crossing, river-flats near Mile 132, No. 9985; Pelly River valley, wet, grassy margin of lake, Mile 136, Nos. 9768 and 9640.

A common lowland species on Palæozoic sediments along the Canol Road. In the Yukon previously known from a single station on Lake Laberge.

Carex aurea Nutt.; Hult., Fl. Al. and Yukon **2** : 332 (1942).

Whitehorse, along Lewes River, M. P. and R. T. Porsild, No. 100; lower Lapie River, gravelly river-flats opposite Mile 127, No. 10007; Pelly River valley, wet grassy margin of lake near Mile 136, No. 9878. In addition, noted in several places from Nisutlin River north to the Pelly.

Distribution similar to preceding but less common.

Carex vaginata Tausch.; Hult., Fl. Al. and Yukon **2** : 372 (1942).

Lower Lapie River crossing, common in a spruce bog near Mile 132, No. 9264; same place, No. 9562; grassy slopes above timber-line on mountain south of Mile 132, elevation 5,000 feet, No. 9913.

Apparently a rare species which, in southeast Yukon, is restricted to Palæozoic rocks of Pelly Valley.

Carex capillaris L.; Hult., Fl. Al. and Yukon **2** : 374 (1942), pro min. pte.

Rocky summit of mountain south of Mile 132, elevation 5,600 feet, No. 9908. Also collected in Macmillan Pass, east of Alaska-Yukon boundary, N.W.T. (11209), and on Haines Road near boundary, M. P. and R. T. Porsild, No. 240.

Apparently a very rare, arctic-alpine species in Alaska and Yukon where it is restricted to high mountains and probably always to Precambrian rocks.

Carex capillaris L. var. **elongata** Olney, Caric.-Bor. Am. 5 (1871) nomen nudum; Fernald, Proc. Am. Acad. **37** : 509 (1902).

C. capillaris, forma *major* Kük. in Engler, Pflanzenr. **4**, 2 : 590 (1909), not var. *major* Drej., Revis. Crit. p. 54 (1841).

C. capillaris Porsild in Rhod. **41** : 202 (1939); Hult., Fl. Al. and Yukon **2** : 374 (1942), pro max. pte.

Lower Lapie River crossing, Mile 132, in a muskeg, No. 9532; Pelly River valley, wet, grassy margin of lake near Mile 136, No. 9650.

The var. *elongata* is a common lowland plant in southeastern Yukon where it was noted in river valleys and in lowland bogs in marshy places between Nisutlin and Pelly Rivers. Unlike the arctic-alpine plant, it appears to be a pronounced calciphile. Nearly all specimens of *C. capillaris* seen by the writer from Alaska-Yukon should be referred to var. *elongata* as should most, if not all of those reported as *C. capillaris*, from forested parts of North America.

To the diagnosis given by Fernald, l.c., should be added that the entire plant is fresh green, the leaves thin, up to 4 mm. wide, flat or barely revolute at the margins; the pistillate scales are pale green, with light brown centre and broad hyaline margins; the perigynia are green, or pale brown in age, dull, with a long, evenly tapering beak which is strongly scabrous near the tip.

As pointed out by Fernald, l.c., the var. *elongata*, by "its tall lax habit and very distant spikelets hardly suggests the dwarf alpine *C. capillaris* with approximate spikelets."

It would appear natural, therefore, to consider var. *elongata* distinct, were it not for a certain amount of overlap, particularly in the east, where it meets with *C. capillaris*. Fernald, l.c., also has noted that var. *elongata* is indistinguishable from some European plants. Thus, *Carex capillaris*, Pl. Finl. Exs. 132a and Fl. Hung. Exs. 270, both are a very close match for *C. capillaris* var. *elongata* as represented by Pl. Exs. Gray. 34.

Kükenthal, l.c., considered var. *elongata* Olney synonymous with *capillaris β major* Drej.; the latter actually is a very different plant, as shown by the fine plate in Fl. Dan. 2374, fig. 3 (1843) and the diagnosis "β major et robustior (subpedalis) spicis suboctonis, terminali androgyna (apice v. rarius basi feminea) femineis sub 10-floris, perigyniis minoribus, pallidioribus longe stipitatis ovata-oblongis, caryops. concolore grisea.—Grönland." *C. capillaris* var. *Porsildiana* Polunin in Journ. Linn. Soc. Bot. **52** : 373 (1943) from Greenland and the Hudson Bay region seems very close to var. *major* Lge., whereas the plant which Polunin, Nat. Mus. Canada, Bull. **92** : 123 (1940) discusses under f. *major* is clearly var. *elongata* Olney, at least in part.

Carex Krausii Boeck.; Hult., Fl. Al. and Yukon **2** : 376 (1942).

C. capillaris var. *nana* Kük.

Besides a single Yukon station at Whitehorse, known from a few stations on the eastern Pacific coast of Alaska and from eastern part of the Alaska Range.

Carex Williamsii Britt.; Hult., Fl. Al. and Yukon **2** : 376 (1942).

In Yukon known only from the type locality, at Dawson.

Carex Oederi Retz. var. **viridula** (Michx.) Kük. in Pflanzenr. **38** (iv. 20) 674 (1909).

Whitehorse, by a small lake north of Lewes River, August 6, 1944, R. T. Porsild; ibid., M. P. and R. T. Porsild, No. 98. New to the flora of Yukon but previously recorded from the Pacific coast of Alaska.

Carex petricosa Dew. in Am. Journ. Sci. **29** : 246 (1836).

Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, on a dry, gravelly slope of 5,500-foot elevation, No. 10113.

Our plant has long, scaly rhizomes and forms small, compact tussocks or colonies. Although the terminal spike is described as being androgynous, the large material now available shows that the terminal 1 to 3 spikes are, as a rule, staminate. A few staminate flowers are often present at the summit of the lateral spikes as well. The species is said to have three stigmas, but two stigmas are almost as common. It is a pronounced calciphile.

The known range of this rare species, until recently recorded only from mountains of Alberta near the type locality, has lately been extended to the mouth of Mackenzie Delta, the Arctic Coast east of the Mackenzie, Great Bear Lake, and the east slope of Mackenzie Mountains. (*See* Porsild, Sargentia **4** : 19 (1943) and Nat. Mus., Canada, Bull. **101,** Biol. Ser. **30** : 16 (1945)). It is new to the flora of Yukon.

Carex Franklinii Boott in Hook., Fl. Bor.-Am. **2** : 217, Pl. 218 (1839).

Rose-Lapie River pass, southwest slope of mountain west of Mile 116, dry, alpine slopes above timber-line, elevation 5,000 feet, No. 10054.

Our specimens are a close match for a series in the National Herbarium of Canada from the type locality on the upper Athabasca River, Alberta, which, until now, has remained the only known station for this interesting and rare species. Our plant grew on a dry, calcareous slope in turfy soil with *Arctostaphylos Uva-ursi* var. *adenotricha,* not far from the new station for *C. petricosa* (*See* this). These only two known stations for *C. Franklinii* are separated by a gap of 900 miles.

Carex misandra R. Br. in App. Parry's Voy. 283 (1823).

An arctic species which thus far has not actually been recorded from Yukon but which, undoubtedly, is found on the Arctic Coast and on high mountains of the interior. It was common along the Canol Road, in Macmillan Pass, just east of the Mackenzie-Yukon Divide, and probably is common on mountains of the Ogilvie Range.

Carex atrofusca Schk., Riedgr. 106 (1801).

An arctic species which, like the preceding, has not actually been collected in Yukon but which, no doubt, will be found on the Arctic Coast and on high mountains of northern Yukon.

Carex lasiocarpa Ehrh. in Hannov. Mag. 132 (1784).

Typical specimens of *C. lasiocarpa* were recently collected along the Alaska Highway west of the Yukon border, at Mile 1226 and 1391, Anderson, No. 9142, and Anderson and Brown, No. 10239, where the species may be a recent introduction as, otherwise, it is not known to occur in the Northwest beyond Athabasca Lake (Raup).

Carex laxa Wahlenb. in Vet.-Akad. Handl. **24** : 156 (1803).

Since Hultén, Fl. Al. and Yukon **2** : 370 (1942), reported *C. laxa* as new to North America, from Alaska Highway, Alaska, Anderson, Nos. 2712 B and 2719 B, a second collection of typical *C. laxa* has been discovered in the Mackenzie Delta, south end of Richards Island, Porsild, No. 16784. The species may thus be expected to turn up also in Yukon.

Carex rariflora (Wahlenb.) Sm. in Engl. Bot. pl. 2516 (1813).

Thus far all reports from Yukon of this arctic species have proven erroneous, but inasmuch as it occurs on the north coast of Alaska and in Mackenzie Delta, and also on the east slope of Mackenzie Mountains, it will no doubt be found also along the arctic coast of Yukon.

Carex limosa L.; Hult., Fl. Al. and Yukon **2** : 369 (1942).

South shoulder of Mount Sheldon, Mile 219, in wet *Carex*-bog in saddle between Mount Sheldon and Mount Riddell, elevation 4,300 feet, No. 11664; northeast spur of Mount Sheldon, in a floating *Scirpus caespitosus* bog with *C. paupercula*, near Mile 226, No. 11665.

Apparently a very rare species which was seen nowhere else. Our specimens were in fruit on August 4. In Yukon previously known only from White River.

Carex paupercula Michx., Fl. Bor.-Am. **2** : 172 (1803).

C. magellanica Hult., Fl. Al. and Yukon **2** : 370 (1942).

Pass between Teslin and Nisutlin Rivers, Mile 14, in a sphagnum bog in timber-line *Abies* forest, elevation 5,000 feet, No. 11032; east slope of Rose River valley, Mile 77, in a sphagnum bog, No. 10264; northeast spur of Mount Sheldon, on a floating bog, Mile 226, No. 11461.

Apparently a rare species which, in the Yukon, has been collected only once before, at the mouth of Klondike River. It grows in sphagnum bogs on Mount Sheldon with *Carex limosa*, *Scirpus caespitosus*, and *Oxycoccus microcarpus*.

Carex macrochaeta C. A. Mey.; Hult., Fl. Al. and Yukon **2** : 356 (1942).

A Pacific Coast species which in Yukon has been collected at Lake Bennett, the headwaters of Frances River, and Whitehorse. It was recently collected along Haines Road in southeast Yukon, Clarke, Nos. 552 and 553.

Carex Parryana Dew. in Am. Journal Sci. **27** : 239 (1835).

Whitehorse, hillsides and river terraces east of Lewes River, No. 10658 with fully matured fruits on July 29. Also south end of Kluane Lake, Anderson, No. 9371. In addition, there is in the National Herbarium of Canada an unrecorded specimen collected at Eklutna, Alaska, June 26, 1941, Anderson, No. 6974.

These new stations represent a considerable extension of the known range of this species, the nearest of which is in Columbia Valley, B.C., more than 1,000 miles to the south. *C. Parryana* belongs to that group of relic prairie species now isolated in the Alaska-Yukon flora.

Carex media R. Br. in Richards. in Franklin's Journ. App. 750 (1823).

C. angarae Steud. *See* Fernald in Rhod. **44** : 304 (1942).

C. norvegica ssp. *inferalpina* Hult., Fl. Al. and Yukon **2** : 348 (1942).

Pass between Teslin and Nisutlin Rivers, alpine slopes of mountains east of Mile 14, elevation 6,000 feet, No. 11030; muskeg spruce forest west of Nisutlin River, Mile 36, No. 10761; east slope of Rose River valley, Mile 77, in a pine bog, No. 10250; Rose River, Mile 95, gravelly river-flat, No. 11983; lower Lapie River crossing, Mile 132, in a muskeg, Nos. 9959 and 9677; Pelly River valley, in a spruce bog near Mile 136, No. 9881; southeast slope of Mount Sheldon, steep ravines below timber-line, 4,500-foot elevation, No. 11709.

Carex media is a common species in wet, mossy woods and muskegs of low to moderate elevations, and but rarely ascends above timber-line (No. 11030).

Carex stylosa C. A. Mey.; Hult., Fl. Al. and Yukon **2** : 351 (1942).

Southwestern Yukon, Haines Rd., Mile 85, Clarke, No. 555. In Yukon otherwise known from Dawson.

Carex stylosa apparently is very rare in the interior where it may be confined to high mountains. Typical specimens were collected on the east slope of Mackenzie Mountains at Bolstead Creek, Mile 111E., N.W.T., by Wynne-Edwards, Nos. 8404 and 8405.

Carex consimilis Holm in Am. Journ. Sci. 4, **17** : 310 (1904). *See* Porsild, Sargentia **4** : 23 (1943).

C. lugens Mackenzie in N. Am. Fl. **18** : 401 (1935), in part, not Holm.

C. Bigelowii Hult., Fl. Al. and Yukon **2** : 334 (1942), at least as regards plant of Yukon and central Alaska.

Dawson district, Klondike Indian Divide, Macoun, No. 53878 (type); Lake Kluane, Burwash Landing, 6,000 to 7,000 feet, Clarke, Nos. 208 and 209; same place, August 11-27, 1920, A. Müller.

Carex consimilis was not seen by us along Canol Road and in Yukon, apparently, is limited to the unglaciated central parts and to the Arctic Coast.

Carex microchaeta Holm in Am. Journ. Sci. 4, **17** : 305 (1904).

C. podocarpa Mack. in N. Am. Fl. **18** : 362 (1935), in part; Hult., Fl. Al. and Yukon **2** : 362 (1942), in part, not R. Br.

C. nesophila Porsild in Rhod. **41** : 207 (1939), as regards plant of central Alaska only; idem in Sargentia **4** : 21 (1943); idem in Nat. Mus., Canada, Bull. **101**, Biol. Ser. **30** : 16 (1945), not Holm.

(Plate XIII, figures 1 and 2)

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, Nos. 10976, 10979, and 11026; east slope of Rose River valley, upper slope of granite mountain, 5,000 to 6,000 feet elevation, Nos. 10160, 10161, and 10492; granite mountain range west of Rose River, Mile 95, alpine, grassy slopes, elevation 5,600 feet, Nos. 10546 and 10549; lower Lapie River crossing, upper slopes of mountain south of Mile 132, Nos. 9601, 9907, and

9914; south shoulder of Mount Sheldon, rocky slope above timber-line, elevation 6,000 feet, No. 11593. In addition, the following specimens of *C. microchaeta* are in the National Herbarium of Canada. Alaska: Goldstream Creek and Pedro Dome north of Fairbanks, A. E. and R. T. Porsild, No. 121; Cantwell, Broad Pass in Alaska Range, idem, Nos. 15 and 16. Yukon: Klondike Indian Divide, August 14, 1902, John Macoun, No. 53877 (type); north of Orange Fork of Black River 66°10′N, 141° W., D. D. Cairnes (Can, No. 81655); mountains north of McQuesten River, Christie, No. 17; south end of Lake Kluane, Anderson, No. 9397. Northwest Territories: Mackenzie Mountains, range west of Bolstead Creek, Canol Road, Mile 111E., Wynne-Edwards, No. 8258; Little Keele River, Porsild and Breitung, No. 11784; east slope of Richardson Mountains west of Mackenzie Delta, Porsild, No. 6644.

Holm, l.c., compared his *C. microchaeta* with *C. Tolmiei* and *C. spectabilis*. Kükenthal, l.c., who had seen no material of it, tentatively placed it with *C. Tolmiei* var. *invisa* (Bail.) Kük. Mackenzie saw the type, which is now before me, and annotated it "*Carex Tolmiei* Boott," although a pencil sketch by Holm, attached to the type sheet, calls attention to the fact that *C. Tolmiei* is phyllopodic, whereas *C. microchaeta* is aphyllopodic. Mackenzie, l.c., later reduced *C. Tolmiei* to synonymy under *C. podocarpa* and with it *C. microchaeta*. As I have shown under *C. podocarpa*, Mackenzie, l.c., clearly misinterpreted that species and Hultén, l.c., has followed him citing, under *C. podocarpa*, the type of *C. microchaeta*—"Klondike - Indian Divide, August 14, 1902, Macoun (G and Can, type of *C. microchaeta* Holm)." On August 14, 1902, however, Macoun collected two plants; one, No. 53876, is typical *C. podocarpa*; the other, No. 53877, is the type of *C. microchaeta*. With the large material now on hand it is evident that *C. microchaeta* is actually much more closely related to *C. nesophila* Holm of the Bering Sea region than to either *C. podocarpa* or *C. spectabilis*. It differs from *C. nesophila* by its slightly scabrous culm, less prominently veined pistillate scales, more intensely purple-spotted perigynia, exserted styles, and by the absence of fibrillose scale-like leaves on the rhizome. If the two plants were to be combined under one name, *C. microchaeta* has priority over *C. nesophila*.

Carex microchaeta is one of the most common sedges on high mountains of southwestern Yukon where it sometimes is a dominant species on turfy, not too dry, grassy slopes above timber-line.

General distribution. High mountains of central Yukon and Alaska east to Mackenzie and Richardson Mountains of Northwest Territories, west to the Bering Sea region (*C. nesophila*).

Carex podocarpa R. Br. in Richards. in App. Franklin Journ. 751 (1824); Hook., Fl. Bor.-Am. **2** : 224, tab. 224 (1840). Kükenthal, in Engler, Pflanzenreich 4, **20** : 411 (1909); Porsild in Rhod. **41** : 205-6 (1939); idem in Sargentia, **4** : 21 (1943); idem in Nat. Mus., Canada, Bull. **101**, Biol. Ser. **30** : 17 (1945).

C. montanensis Bailey in Bot. Gaz. **17** : 152 (1892); Mackenzie in N. Am. Fl. **18** : 360 (1935); idem, N. Am. Caric., tab. 416 (1940); Hult., Fl. Al. and Yukon 358 (1942); not *C. podocarpa* Mackenzie, N. Am. Fl. **18** : 362 (1935), or idem, tab. 419; nor Hulten, l.c., 362.

(Plate XII, figures 1 and 2)

Pass between Teslin and Nisutlin Rivers, alpine meadows near snow-flushes east of Mile 14, elevation 5,000 feet, Nos. 10980 and 11025; Rose River valley, alpine slopes east of Mile 77, No. 10940; alpine meadows on mountain east of Mile 85-90, No. 10162; upper Rose River, gravelly outwash plain, Mile 95, No. 10435; granite mountain range west of Mile 95, alpine meadows and grassy slopes, elevation 5,600 feet, No. 10548; same place, No. 10547 (*C. podocarpa* x *microchaeta*); alpine meadows by a brook on mountain slope east of Mile 95, elevation 4,500 feet, Nos. 10489, 10490 and 10493; lower Lapie River crossing, grassy upper slopes of mountain south of Mile 132, elevation 5,600 feet, No. 9912; south shoulder of Mount Sheldon, in *Carex* bog in saddle between Mount Sheldon and Riddell, No. 11663; upper south fork of Macmillan River, mountain west of Mile 268, open fir forest near timber-line, No. 11330. Also Dawson district, Klondike Indian Divide, Macoun, Can, 53876; McQuesten River, July 6, 1943, Bostock; Kluane Lake, 6,000- to 7,000-foot elevation, Clarke, No. 210, and the Arctic Coast, Shingle Point, Porsild, Nos. 6903 and 7090.

As pointed out by the writer, l.c., 205-6, *C. podocarpa* has been misunderstood by most writers, perhaps due to the poor illustration given by Hooker, l.c., of a young, immature plant.[1] Kükenthal, l.c., however, recognized the true *C. podocarpa* from Hooker's description and gave a better description. *C. montanensis* Bailey is clearly our plant, and it is difficult to understand why Mackenzie, l.c., and also Hultén, l.c., have both overlooked that Brown in Hooker, l.c., definitely described *C. podocarpa* as aphyllopodic ("foliis caulinis inferioribus brevioribus lanceolatis"). In his key, Hultén, l.c., pp. 345-6, has placed *C. "podocarpa"* and *C. nesophila* under the heading: "Culms phyllopodic, lacking stem leaves," thereby showing that he, too, did not have the real *C. podocarpa* before him. *C. microchaeta* and *C. podocarpa* may sometimes be found growing together at high altitudes when hybridization may occur (No. 10547).

The large series of *C. podocarpa* in the writer's collection from Alaska, Yukon, and Mackenzie District shows that this species in favourable stations may become 100 cm. high, whereas in alpine stations it is a moderately low plant 15 to 20 cm. high. The culms are usually smooth, but specimens with scabrous culms are not uncommon. The low, alpine form may sometimes resemble *C. microchaeta* from which it may always be distinguished by its aphyllopodic culms.

Carex podocarpa is a very distinctive species which is common or even dominant in subalpine meadows, by alpine brooks, or on slopes watered by snowfields, in mountains of Alaska and Yukon north to the Arctic Coast, east to the Mackenzie, and south to high mountains of Alberta and British Columbia.

Carex leiophylla Mackenzie in N. Am. Fl. **18** : 365 (1935); Hult., Fl. Al. and Yukon **2** : 353 (1942).

This striking species thus far is known only from the type locality, at Carcross, where it was recently rediscovered, growing in sand dunes, by Anderson and Brown, No. 10345.

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[1] A specimen of *C. podocarpa* collected by Richardson, is now in the Gray Herbarium. It was formerly in the Herbarium John A. Lowell and bears the original label "370 Carex podocarpa Br. Richardson's Arctic Plants". The specimen bears a strong resemblance to, and may indeed be, the original from which Hooker's plate was drawn.

Carex atrosquama Mack. in Proc. Biol. Soc. Wash. **25** : 51 (1912).

C. atrata ssp. *atrosquam[e]a* Hult., Fl. Al. and Yukon **2** : 354 (1942).

Pass between Teslin and Nisutlin Rivers, alpine meadows east of Mile 14, No. 10981; steep, densely wooded east slope of Quiet Lake, Mile 55-60, No. 11108; east slope of Rose River valley, rocky river-bank meadow, Mile 77, No. 10256; same place in open woods, No. 10260; east slope of granite mountain in Rose River valley, Mile 85-90, No. 10163; upper Rose River, gravelly river meadow, No. 10354; upper Rose River, subalpine meadow on steep west slope of mountain east of Mile 95, No. 10491; subalpine meadows in Rose-Lapie River pass, Mile 102, Nos. 9289, 10603, and 10607; Rose-Lapie River pass, alpine meadows above timber-line on schist mountain east of Mile 105, No. 10880; subalpine meadow near Lapie Lake, Mile 105, No. 9795; south shoulder of Mount Sheldon, Mile 219, grassy slope above timber-line, No. 11591; upper south fork of Macmillan River, gravelly outwash plain opposite Mile 280, No. 11293.

Hultén, l.c., who had seen only two immature collections of our plant, states that "it differs very slightly" from *C. atrata* and that he considers it a geographical race: *C. atrata* ssp. *atrosquam[e]a* Hult. *C. atrosquama* is actually very distinct from *C. atrata* and in life does not even closely resemble that species. In *C. atrata* the spikes are distinctly black, the mature perigynia smooth, not conspicuously punctate, pale, greenish yellow with a short but distinctly bidentate beak. In *C. atrosquama*, because the scales are shorter and do not cover the perigynia, the spikes do not appear black, but variegated; the mature perigynia are strongly punctate and deep golden brown; the beak is conspicuously black-tipped and very shallowly bidentate or even subentire.

In a large population of *C. atrosquama* it is often possible to find a few plants in which some of the lateral spikes have a few staminate flowers near the apex (No. 10256). Another variation sometimes has a small terminal staminate spike, densely aggregate lateral spikes, the culms very stiff, and the basal leaves shorter than in the typical form. In this form most of the perigynia are empty and the plant is probably *C. atrosquama* x *media* (No. 11215, east slope of Mackenzie Mountains and No. 3457, Great Bear Lake).

Carex atrosquama is a common or even dominant species in subalpine meadows of southeastern Yukon where it ascends at least to 5,000 feet. It is a strikingly handsome species with culms sometimes 85 to 90 cm. tall.

It is new to the flora of Yukon but has been recorded from mountains of central Alaska, the east slope of Mackenzie Mountains, Great Bear Lake, south to mountains of Alberta, British Columbia, Montana, and Oregon.

Carex atratiformis Britt.; Hult., Fl. Al. and Yukon **2** : 355 (1942).

Whitehorse, Ear Lake, M. P. and R. T. Porsild, No. 49; alluvial meadows on west bank of Nisutlin River opposite Mile 36, Nos. 10760 and 10762; east slope of Rose River valley, open pine woods near Mile 77, No. 10252.

Apparently a rare species, in Yukon previously known only from Frances River and Dawson.

Among a collection of unnamed Alaska and Yukon plants in the National Herbarium, Ottawa, collected by M. O. Malte, is a sheet of typical *C. atratiformis* which, in the collector's hand has been labelled "Skagway, Alaska, Aug. 25, 1916". *C. atratiformis*, otherwise, is not known to occur on the Pacific Coast, and if correctly labelled this collection is the first from Alaska.

Carex Buxbaumii Wahlenb. in Sv. Vet.-Akad. Nya Handl. **24** : 163 (1803).

Whitehorse along Lewes River, M. P. and R. T. Porsild, No. 102; Pelly Valley, on wet, grassy lake shore near Mile 136, No. 9769.

Apparently a rare species not previously recorded from Yukon, although known from a few stations in central and pacific Alaska and from Great Bear Lake.

Carex scopulorum Holm; Macoun in Geol. Surv., Canada, Sum. Rept. 1912, 438 (1914); Hult., Fl. Al. and Yukon **2** : 336 (1942).

Alaska-Yukon boundary, 66° 25′ N., D. D. Cairnes; Dawson Range, 62° N., 138° W., near the source of Klaza River, elevation 4,200 feet, July 12, 1933, H. Bostock.

J. M. Macoun's report of *C. scopulorum* was based upon a single incomplete specimen collected by Cairnes. In view of the fragmentary nature of the specimen "lacking the basal parts and with only fragments of leaves" and "the fact that the bracts are 3 mm. broad, leaf-like and about as long as the inflorescence," Hultén, l.c., was unable to confirm the report.

The Bostock collection is that of a young but quite typical plant, except that, like Cairnes' plant, it has large, leaf-like bracts. There are, however, in the National Herbarium of Canada, several specimens of *C. scopulorum* from Colorado showing leaf-like lower bracts exactly as in our plant. There can be little doubt, therefore, that *C. scopulorum* actually is found in Yukon notwithstanding the fact that the nearest known station for that species is at Banff, Alberta (Malte and Watson, No. 2223), 1,150 miles from Dawson Range.

Carex kokrinensis Porsild in Rhod. **41** : 206, tab. 551, figs. 1-3 (1939); Hult., Fl. of Al. and Yukon **2** : 340 (1942).

Upper south fork of Macmillan River, in a gravel outwash plain opposite Mile 280, elevation 4,200 feet, August 31, 1944, No. 11294. Additional typical material was collected June 24-25, 1948, in Alaska along Steese Highway, between Fairbanks and Circle, Ernest Lepage, Nos. 23273, 23275, and 23304. Our specimens, and also Lepage, No. 23273, have fully mature fruits.

Abundant material of this curious sedge, previously known only from the type locality in Kokrines Mountains in Alaska, was collected near the west end of Macmillan Pass on an outwash plain subject to spring floods. *C. kokrinensis* grew here in wet gravel, forming large tussocks, with ascending or even somewhat declining culms weighed down by the fully mature spikes. In habit, the species at this stage thus somewhat resembled a giant *C. bicolor*. To the original description should be added that the mature perigynia show 3 to 4 weak but quite distinct veins on the ventral side and are blotched along the edges.

Carex kokrinensis is not, as suggested by Hultén, l.c., even closely related to *C. aquatilis* as, indeed, a glance at the illustration and the diagnosis would have revealed; nor is there any good reason for assuming that it may be a hybrid of that species. The achenes of the type material are young but not "empty," as stated by Hultén; in the fully mature specimens now available the achenes are ripe and fully developed, and judging from the abundance of seedlings and immature plants seen in Macmillan Pass the species is very fertile.

In the National Herbarium of Canada is a plant collected on Mount Edith Cavell by J. M. Macoun, August 21, 1917 (Can, 97608), which Theo. Holm named *C. vulgaris* var. *lipocarpa* Holm, whereas Mackenzie annotated it *C. Kelloggii* W. Boott. It differs strongly from all *C. Kelloggii* seen by the writer by its gynaecandrous terminal spike and weak culms. It differs from *C. kokrinensis* chiefly in its much paler basal sheaths and by its oblanceolate and more strongly nerved perigynia.

Carex sitchensis Prescott in Bong. in Mem. Acad. Sci. St. Petersb. Ser. 6, Math. **2** : 169 (1833).

A Pacific Coast species known from California north to Cook Inlet, Alaska. Two sheets of typical *C. sitchensis* are in the National Herbarium, collected at Liard Hot Springs, B.C., near the Yukon border, Clarke, Nos. 49 and 50.

Carex aquatilis Wahlenb.; Hult. Fl. Al. and Yukon **2** : 338 (1942), in part.

Pass between Teslin and Nisutlin Rivers, in a river-flat, Mile 14, No. 11134; in water by the edge of a slough west of Nisutlin River, Mile 36, No. 10751; west bank of Nisutlin River, Mile 36, Nos. 10765 and 10767; Rose River valley east of Mile 77, in a bog, No. 10266; upper Rose River, in a wet river meadow near Mile 95, No. 10352; Pelly River valley by the margin of a lake near Mile 136, No. 9770; upper south fork of Macmillan River, subalpine meadow west of Mile 268, No. 11333; Macmillan Pass, Mackenzie-Yukon Divide, river-flat, Mile 284-290, No. 11212.

Carex aquatilis is a very common to dominant species in wet river meadows, sloughs, and by the edge of lowland lakes. In southeast Yukon it is not found above the valley bottoms where it is one of the important species in hay meadows. In the Macmillan Pass it ascends to an elevation of 4,600 feet.

Carex stans Drejer in Naturh. Tidsskr. 458 (1841).

C. aquatilis Hult., Fl. Al. and Yukon **2** : 338 (1942), in part.

Macmillan Pass, Mackenzie-Yukon Divide, open alpine tundra, Mile 284-290, No. 11204; also Arctic Coast, Shingle Point, Porsild, No. 7087; Herschel Island, Can. Arct. Exp., Nos. 214 and 250.

Carex stans belongs with a group of arctic rather than alpine species which apparently is absent in the high mountains of Yukon and Alaska. It was not encountered until the Mackenzie-Yukon Divide was reached.

Carex lugens Holm, Hult., Fl. Al. and Yukon **2** : 335 (1942).

Apparently a common species in unglaciated parts of central Yukon but, like *C. consimilis*, not seen by us anywhere along Canol Road.

Carex microglochin Wahlenb. in Sv. Vet.-Akad. Nya Handl. **24** : 140 (1803).

Sandy river-flats on lower Lapie River, near Mile 127, No. 10004; Pelly River valley, in wet, calcareous clay by edge of a small lake, near Mile 136, No. 9882.

Apparently a rare species not previously recorded from Yukon and probably restricted to Palæozoic sediments.

Carex atherodes Spreng.; Hult., Fl. Al. and Yukon **2** : 384 (1942).

East slope of Rose River valley, in a meadow east of Mile 77, No. 10261; northeast spur of Mount Sheldon, in a subalpine meadow near Mile 226, in wet places by a pond, No. 11460. The species was noted also in meadows in Pelly Valley near Mile 136.

Apparently a rare species collected in Yukon only once before, at Whitehorse, and belonging to the group of relic prairie species. At Mount Sheldon the species, on August 4, had young immature fruits that probably would not mature before the onset of winter. In Pelly Valley it had not yet reached the flowering stage on June 25.

Carex physocarpa Presl; Hult., Fl. Al. and Yukon **2** : 380 (1942).

Whitehorse, Miles Canyon, M.P. and R. T. Porsild, Nos. 59 and 103; Johnson Crossing, idem, Nos. 470, 607, 609, and 745; Rose River valley, in a bog near Mile 77, Nos. 10254 and 10255; upper Rose River, gravelly river-flats near Mile 95, No. 10353; Rose-Lapie River pass, in shallow water of a small lake near Mile 102 (lateral spikes all androgynous), Nos. 10605 and 10606; lower Lapie River crossing, sandy river-flats near Mile 132, No. 9986; Ross River valley, in a slough near north end of Sheldon Lake, Mile 222, No. 11534; south shoulder of Mount Sheldon, in a wet bog, elevation 4,300 feet, No. 11662; valley of the south fork of Macmillan River, forming almost pure stand in wet meadow near Mile 250, No. 11410; Macmillan Pass, Mackenzie-Yukon Divide, alpine tundra bog, Mile 284-90, No. 11205; same place, in shallow water of a lake, No. 11214.

Carex physocarpa is a very variable species which is extremely common in lowland stations, in wet meadows, on wet alluvial flats, and by the edge of shallow lakes. On Mount Sheldon it ascends to 4,300 feet.

Hultén, l.c. remarks that certain forms of *C. physocarpa* may be difficult to distinguish from *C. saxatilis*, but that in *C. physocarpa* "the mouth of the sheath of the leaves (not the ligulae) is V-shaped (with the apex of the V upwards) while in *C. saxatilis* it is convex and usually lower than it is broad." The writer spent considerable time in the field looking for characters by which low, short-peduncled forms of *C. physocarpa* might be distinguished from specimens of *C. saxatilis*. All sheaths examined had concave or slightly V-shaped mouths; but in no instance did the description suggested by Hultén seem to match the actual specimens, unless the plant was viewed upside down. In any event, the sheath character is not very helpful, because early rupturing greatly affects the shape of the mouth. The writer noticed considerable variation in the shape of the style, the base of which normally is sharply bent downward against the achene, inside the perigynium. In all specimens examined from Mount Sheldon and vicinity, the style of the mature achenes is straight or, at most, somewhat flexuous near the base (Nos. 11534, 11662, and 11410), whereas in the still more alpine Macmillan Pass the styles in all specimens examined were sharply bent as in typical *C. physocarpa.*

Carex membranacea Hook.; Hult., Fl. Al. and Yukon **2** : 382 (1942).

Rose River valley, in a pine bog near Mile 77, No. 10249; Rose-Lapie River pass in a river meadow near Mile 105, Nos. 9241 and 9242; lower Lapie River crossing, Mile 132, in open spruce woods, No. 9500; same place, on wooded slope, Nos. 9563 and 9823; Pelly River valley, alluvial flat near Mile 136, No. 9883; northeast shoulder of Mount Sheldon, Mile 222, rocky alpine slope near the head of a spring, elevation 5,000 feet, No. 11064.

Carex membranacea is a common species, especially on alpine slopes and on gravel and sandbars of alpine rivers.

Hultén, l.c., suggests that *C. membranacea* is closely related to *C. saxatilis* and remarks that the subterranean parts especially are like those of *C. saxatilis.* In the field, at least, this alleged similarity is not very obvious. In fact, *C. membranacea* entirely lacks the short, stout rhizomes of *C. saxatilis.* Its long and stolon-like, scaly rhizome is much as in *C. Bigelowii* or *C. consimilis,* whereas the leaves are broad and flat and very strongly phyllopodic. The curled-up old leaves persist for several years, as in *C. rotundata.*

Carex rostrata Stokes; Hult., Fl. Al. and Yukon **2** : 378 (1942).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild No. 534; alluvial flats west of Nisutlin River, near Mile 36-39, in water by a slough, No. 10752; Pelly River valley bordering a small lake in a spruce forest, near Mile 136, No. 9880.

A common species in wet sloughs of the Nisutlin, Pelly, and Ross River valleys, but rather uncommon elsewhere. The species was seen as far north as Lake Sheldon.

Carex rhynchophysa C. A. Mey.; Hult., Fl. of Al. and Yukon **2** : 380 (1942).

C. laevirostris (Blytt) Fr.

Alluvial flats west of Nisutlin River, near Mile 36-39, in water by a slough, No. 10753.

Our specimens grew together with typical *C. rostrata.* In specimens collected at Dawson by Malte, August 10, 1916 (Can), several of the pistillate spikelets at their base bear from a few to 8 short, sessile, lateral spikelets. In Yukon previously known only from Dawson district.

ARACEAE

Calla palustris L.; Hult., Fl. Al. and Yukon **2** : 385 (1942).

Mayo District: Mayo, Anderson, No. 9766; Stewart River flat, Bostock No. 155. This species was not seen by us but in Yukon has been collected once before, near Dawson.

LEMNACEAE

Lemna trisulca L., Sp. Pl. 970 (1753).

Pelly Valley, in a shallow lake, south of Ross Post, Mile 138, No. 11169; Ross Valley, common in lake west of Lewis Lake, near Mile 200, No. 11527.

Although not seen elsewhere, *Lemna trisulca* is probably not uncommon in calcareous or alkaline lakes. It is new to the flora of Yukon but in the Northwest was known from Matanuska Valley, Alaska, the Mackenzie Delta, and from Slave Lake district.

JUNCACEAE

Juncus albescens (Lge.) Fern. For a discussion of the Alaska plant *see* Porsild in Rhod. **41**: 210 (1939).

J. triglumis Hult., Fl. Al. and Yukon **3** : 431 (1943), in part.

Rose River valley, Mile 77, in a pine bog, No. 10268; upper Rose River valley, Mile 95, common on gravelly river-flats on outwash plain, Nos. 10355 and 10436; Rose-Lapie Pass, in alpine meadow, Mile 105, No. 9797.

Common to occasional in calcareous alluvial soils at low to moderate elevations in the Pelly Range but not seen north of Lapie Pass, where the species flowered on June 22. The species is new to the flora of Yukon; it was found also on the east slope of Mackenzie Mountains.

Juncus alpinus Vill. ssp. **nodulosus** (Wahlenb.) Lindm.; Hult., Fl. Al. and Yukon **3** : 417 (1943).

Pelly River valley, edge of small lake, near Mile 136, No. 9884; same place, in clay soil on edge of slough, No. 11168. Also Haines Road, near boundary, M. P. and R. T. Porsild, No. 170.

Apparently a rare species recorded but once before from the Yukon (Indian River). Number 11168 had immature fruits on July 7.

Juncus balticus Willd. var. **alaskanus** (Hult.) Porsild n.comb.

J. arcticus ssp. *alaskanus* Hult., Fl. Al. and Yukon **3** : 418 (1943).

Whitehorse, M. P. and R. T. Porsild, Nos. 28 and 105; in meadows and river-flats on Sydney Creek west of Nisutlin River, Mile 30, No. 10769; upper Rose River valley, on gravelly river-flats near Mile 95, No. 10474; lower Lapie River, gravelly river-flats near Mile 127, No. 10009; lower Lapie River crossing, river-flats near Mile 132, No. 9527.

Common to occasional on river-flats in alluvial soils derived from Palæozoic rocks in the southern part of the area but not seen by us north of Pelly River. On the lower Lapie River fruiting specimens were collected on June 27.

The specimens in the present series are rather uniform and differ from other North American races of *J. balticus* by their slender growth, rather short involucral bract, and short stamens that in length about equal the filaments. Hultén, l.c., considers this plant a subspecies of *J. arcticus* from which it is said to differ by its open, lax inflorescences, slender culms, and paler capsules. These characters, however, are just those by which

J. balticus s. lat. may be distinguished from *J. arcticus*, and to the writer, who is very familiar with *J. arcticus* in the field, it seems best to consider the Yukon-Alaska plant a race of *J. balticus* rather than of *J. arcticus*. Typical specimens of the latter, in the National Herbarium of Canada, from Lapland, Greenland, and eastern arctic Canada, besides their few-flowered, dense inflorescences, and larger, almost black capsules, have smaller anthers on slender filaments generally twice as long as the anthers.

The geographical distribution of *J. arcticus* also favours the view that the Alaska-Yukon plant is a variety of *J. balticus* rather than of *J. arcticus*. The latter in North America is an eastern species which, from Greenland and Labrador, has not penetrated far west of Hudson Bay. In fact its presence in North America has not been generally accepted until recently and was questioned by Buchenau who, in his Monographia Juncacearum p. 223, says: "Aus Nordamerika und den angrenzenden Inseln sah ich noch keinen echten *J. arcticus*", and by Engelmann before him, who in North American Species of *Juncus*, Trans. Acad. Sci. St. Louis **2** : 445 (1868), said of *J. arcticus* "The only American specimens I have seen were brought from Greenland by Dr. Kane." Moreover, according to Gontscharov & Kreczetowicz, in Fl. U.S.S.R., *J. arcticus* in Siberia does not extend east of the Kolyma River.

Hultén himself may once have held a similar view, for under his *J. arcticus* ssp. *alaskanus* (p. 419), when giving the geographical area of *J. arcticus*, he inadvertently includes "ssp. *montanus*" [presumably meaning *J. balticus* var. *montanus* Engelm.], but lower down on the same page treats that entity as a distinct species under *J. ater* Rydb., which is based on *J. balticus* var. *montanus* Engelm. Hultén's claim that *J. arcticus* from Alaska extends "along the Arctic Coast to northern Hudson Bay" undoubtedly is based upon Hooker's statement in Fl. Bor.-Am. **2** : 189 (1839): "Arctic Sea-coast Richardson" where its presence, however, has not been confirmed by later collectors, whereas large series of *J. balticus* collected by the writer on the Arctic Coast east and west of Mackenzie Delta and on Great Bear Lake are clearly referable to the var. *alaskanus*.

Juncus balticus var. **littoralis** Engelm. in Trans. Acad. Sci. St. Louis **2** : 442 (1868).

J. ater Hult., Fl. Al. and Yukon **3** : 419 (1943).

Whitehorse, on alluvial flats along the Lewes River, No. 10659. Our specimens were in anthesis on July 28-29, a full month later than *J. balticus* var. *alaskanus*. They are a good match for large series collected by Hugh M. Raup on Lake Athabasca and in Wood Buffalo Park, and for other material in the National Herbarium of Canada from the southern Canadian plains. These are all characterized by stout rhizomes, involucral bracts 8 to 9 cm. long, open inflorescences with large flowers, and by their narrow perianth leaves, the outer ones with a broad, pale median line, and by their long anthers on very short broad filaments. Typical of this series is Raup, No. 6609, from Lake Athabasca, with anthers 1·8 mm. long on 0·2 mm. long, stout filaments.

Our plant differs consistently from the littoral var. *Haenkei* (E. Mey.) Buch. which has much longer involucral bracts and shorter anthers that in length equal their filaments. For the latter, Hultén, l.c., has made the new combination, ssp. *sitchensis* (Engelm.) Hult., based on *J. arcticus* ssp. *sitchensis* Engelm., in preference to the much older and well-understood var. *Haenkei* (E. Mey.) Buch.

Juncus biglumis L., Sp. Pl. 328 (1753).

Granite mountain range west of Mile 95 on upper Rose River, in wet clay on a snow flush, elevation 5,600 feet, No. 10552; east slope of Mount Sheldon, in a ravine at 6,000-foot elevation, No. 11738; northeast shoulder of Mount Sheldon, forming small clumps in wet places on the edge of alpine lake, 5,600-foot elevation, No. 11065.

Apparently a somewhat rare arctic-alpine species which is new to the flora of Yukon and which, in the interior of Yukon and Alaska, is restricted to high mountain peaks. Immediately south of our area *J. biglumis* is known from White Pass, Alaska, Malte (Can, 107910 and 107916).

Our Yukon specimens are all rather slender and low with the inflorescence reduced to one or two flowers.

Juncus bufonius L.; Hult., Fl. Al. and Yukon **3** : 422 (1943).

An introduced species which has long been established in Yukon: at Whitehorse, Dawson, Mayo, and possibly elsewhere.

Juncus castaneus Sm.; Hult., Fl. Al. and Yukon **3** : 423 (1943).

Alluvial meadows on Sydney Creek near Mile 30, west of Nisutlin River, No. 10768; upper Rose River, Mile 95, in river-flats, No. 11987; lower Lapie River, gravelly river-flats near Mile 127, No. 10010; Lapie River crossing, Mile 132, by a muskeg trail, No. 9528; upper south fork of Macmillan River, Mile 268, No. 11338.

Occasional to common throughout Yukon in alluvial soils of river valleys to moderate altitudes; on Mount Sheldon noted at 5,000-foot elevation. On Lapie River the species was first noted in flower on June 16.

Juncus Drummondii E. Mey. in Ledeb. Fl. Ross. **4** : 235 (1853).

Alpine slopes and summits of granite mountain east of pass between Teslin and Nisutlin Rivers, near Mile 14, Nos. 10982 and 11033; steep west slope of granite range east of upper Rose River, Mile 95, in alpine lichen heath, No. 10494; alpine meadows west of Mile 95, elevation 5,600 feet, No. 10554; south shoulder of Mount Sheldon, on grassy slopes and ridges above timber-line, elevation 4,500 to 6,000 feet, No. 11594; east slope of Mount Sheldon, in steep ravines, No. 11768; upper south fork of Macmillan River, on snowflushes of shale mountain west of Mile 268, No. 11339. Also collected in Macmillan Pass east of the Northwest Territories boundary.

Apparently common and sometimes even a dominant species in alpine meadows and on snowflushes above and near timber-line where, owing to the lateness of the habitat, the species flowers and fruits late. Specimens on Mount Sheldon had mature fruits the second week of August. The species, which was never seen in the lowland, is new to the flora of Yukon, and in Alaska was known only from a few stations along the Pacific Coast west to the Aleutian Islands.

Juncus Dudleyi Wieg. in Bull. Torr. Bot. Cl. **27** : 524 (1900).

Ross River valley, in a wet meadow near the north end of Sheldon Lake, opposite Mile 222, elevation 3,000 feet, No. 11535.

Our specimens are rather low with culms 10 to 20 cm. high exceeded by the flat leaves; the yellowish brown auricles at the summit of the sheaths indicate this species rather than *J. tenuis* or *J. macer*. Our specimens on August 16 had almost mature capsules.

The collection constitutes a considerable extension of the known range of this species, in Canada known from Newfoundland to British Columbia north to Lake Athabasca. It is thus new to the flora of Yukon.

Juncus filiformis L.; Hult., Fl. Al. and Yukon **3** : 427 (1943).

Rose-Lapie River pass, in alpine meadow near source of Rose River, Mile 98-99, No. 11898; Ross River valley in wet meadows near north end of Sheldon Lake opposite Mile 222, Nos. 11536 and 11537. The specimens in the last number are low and with abnormally short bracts.

Juncus filiformis apparently is rare and local in our area and had previously been collected only once in the territory, near Dawson. It was quite abundant in wet meadows on Sheldon Lake and locally formed large colonies that on August 5 had not quite mature capsules.

Juncus Mertensianus Bong. in Mém. Acad. Sci. St. Petersb. Ser. 6, **2** : 167 (1833).

Upper Rose River, in gravelly river-flat near Mile 95, elevation 3,600 feet, No. 10473; alpine meadows west of upper Rose River, Mile 95, elevation 5,600 feet, No. 10553; Rose-Lapie River pass, in alpine meadows near source of Rose River, Mile 102, No. 10609; northwest end of Itsi Range south of Macmillan River, Mile 255, No. 11383; upper south fork of Macmillan River, shaly mountain west of Mile 268, in wet moss by a spring, elevation 4,000 feet, No. 11340.

Although not previously recorded from Yukon, *J. Mertensianus* is common in alpine and subalpine meadows at or near timber-line, ascending to 5,600 feet on upper Rose River. On the south fork of Macmillan River the species had only reached anthesis on August 28, and the absence of last year's fruiting heads suggests that it produces mature fruits only in exceptional years.

Luzula arcuata (Wahlenb.) Wahlenb. Fl. Suec. **1** : 218 (1825).

Pass between Teslin and Nisutlin Rivers, alpine slopes of granite mountain east of Mile 14, elevation 4,500 to 6,000 feet, Nos. 10983 and 11034; Rose River valley, alpine slopes east of Mile 77, No. 10943; south shoulder of Mount Sheldon, grassy slopes and rocky ridges above timberline, 4,500 to 6,100 feet, No. 11596; upper south fork of Macmillan River, alpine shaly slopes of mountain west of Mile 268, No. 11336.

A common and often ubiquitous species on alpine slopes and snowflushes of high mountains where it was noted or collected on all mountains climbed, north to Macmillan Pass. Specimens collected on Mount Sheldon were fruiting abundantly on August 7. New to the flora of Yukon.

Luzula confusa Lindeb.; Hult., Fl. Al. and Yukon **3** : 435 (1943).

Rose River valley, alpine slope of granite mountain east of Mile 85-90, 5,000 to 6,000 feet, No. 10164; steep west slope of granite range east of upper Rose River, Mile 95, No. 10495; dry alpine slopes west of Mile 95, elevation 5,600 to 6,000 feet, No. 10551; lower Lapie River crossing, grassy summit of mountain south of Mile 132, No. 9915; south shoulder of Mount Sheldon, alpine slopes above timber-line, No. 11597.

An alpine species noted as fairly common near and above timber-line on all mountains visited north of the Rose-Lapie Pass. Specimens at Mile 132 flowered on June 26; on Mount Sheldon the species ascends to 7,200 feet and on the south slope had matured fruits on August 7.

Luzula multiflora (Retz.) Lej., Fl. envir. Spa. **1**: 169 (1811).

Valley of the south fork of Macmillan River, Mile 240-250, elevation 3,300 feet, No. 11412.

Our specimens grew in a dry *Polytrichum-Sphagnum* bog in the basin of a former pond in a river meadow. The species, which is new to the flora of Yukon, apparently is rare and was seen nowhere else by us. The specimens are intermediate between the typical form and the var. *frigida* (Buch.) Sam. and were fruiting abundantly on August 21-25.

Luzula nivalis (Laest.) Beurl.; Hult., Fl. Al. and Yukon **3** : 438 (1943).

Very rare on rocky ledges of summit of mountain south of Lapie River crossing, Mile 132, No. 9916.

Luzula nivalis s. str. in North America is an eastern race common in northern east and west Greenland and the eastern Canadian Arctic, whence it extends west to the mouth of the Mackenzie with a few isolated alpine-arctic stations in Yukon and Alaska, where it is largely replaced by the rather distinct var. *latifolia* (Kjellm.) Sam.

As to the status of the latter, considerable diversity of opinion prevails. It was described as *L. arcuata* f. *latifolia* Kjellm., Vega Exp. Vetensk. Iakttag. **1**: 566 (1882) tab. 10, based, apparently, on mixed collections containing the species and the variety both. Buchenau, Monogr. Junc. p. 125 (1890), considered it a variety of *L. confusa* or possibly a hybrid between *L. arctica* [*nivalis*] and *L. confusa* but later, in Engler's Pflanzenr. **4** : 36, Heft. **25** : 69 (1906), transferred it to *L. arctica* [*nivalis*] var. *latifolia.* Samuelsson, in Hultén in Fl. Kamtch. **1**: 223 (1927), redescribed it as *L. arcuata* var. *kamtschadalorum* but in Hult., Fl. Aleut. Is., p. 127 (1937), made the combination *L. nivalis* var. *latifolia.* In Fl. U.S.S.R. it appears as *L. kamtschadalorum* (Sam.) Gorodk. ex. Kryl. Fl. Sib. occid. **3** : 551 (1929) with *L. arcuata* f. *latifolia* Kjellm. as synonym.

In his Fl. of Al. and Yukon, p. 439, Hultén places it as a variety of *L. nivalis* but incorrectly maintains "that it can be distinguished from all other *Luzula* species within our area by its broad, practically glabrous leaves with light-brown or yellowish-brown tightly packed sheaths" and in his key (p. 433) distinguishes the variety from the species by its broader leaves, said to be 3·5 mm. wide against 2·5 mm. in *L. nivalis.* As shown by the large series before the writer, typical *L. nivalis* has as broad leaves as the var. *latifolia*[1] which, however, may always be distinguished by its strikingly open and branched inflorescence simulating that of *L. arcuata.*

The var. *latifolia* extends eastward along the Arctic Coast a short distance east of Mackenzie Delta and is also found in Richardson Mountains west of the delta; but it does not extend "eastward at least to Keewatin" as claimed by Hultén (1937), nor is it known to occur on Great Bear Lake.

Luzula parviflora (Ehrh.) Desv.; Hult., Fl. Al. and Yukon **3** : 440 (1943).

Quiet Lake, steep, densely wooded slopes on east shore near Mile 55-60, No. 11110; east slope of Rose River valley, in pine and spruce bogs near Mile 77, No. 10267; same place, on alpine slope above timber-line, elevation 6,000 feet, Nos. 10945-6; Rose-Lapie River pass, alpine slope east of Mile 105, No. 11988; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11462.

Common to occasional throughout Yukon in rich lowland forest soils and in the loamy soils of subalpine meadows, where it was collected or noted from all stations north to Macmillan Pass. Numbers 10945 and 10946 represent a curious, narrow-leaved form that approaches *L. Wahlenbergii* with which it was associated but differs from it by the more numerous stem-leaves and by the lack of white-ciliated bracts in the inflorescence. On Rose River, No. 10267 had almost mature fruits on July 4.

Luzula rufescens Fisch.; Hult., Fl. Al. and Yukon **3** : 441 (1943).

In Yukon collected a few times in Dawson district.

Luzula spicata (L.) DC., Fl. Fr. **3** : 161 (1805).

Pass between Teslin and Nisutlin Rivers, rare on alpine slope of Mountain east of Mile 14, No. 10984; steep west slope of granite range east of upper Rose River opposite Mile 95, in dry, alpine meadow, 5,000 feet, No. 10496; south and east slopes of Mount Sheldon, on dry peaty slope near timber-line, 5,000 feet elevation, No. 11712, south shoulder of Mount Sheldon, grassy slopes above timber-line, 4,500 to 6,000 feet, No. 11595; upper south fork of Macmillan River, rocky alpine slopes above timber-line of shale mountain west of Mile 268, No. 11337; upper south fork of Macmillan River, gravel outwash plain near Mile 280, No. 11297.

Luzula spicata is new to the flora of Yukon where it is found only on high mountains, on dry, sunny slopes above timber-line. On Mount Sheldon noted on a rocky ledge at the summit, at 7,200 feet. On upper Rose River the species had matured fruits on July 18.

Luzula Wahlenbergii Rupr., Beitr. z. Pflanzenk, Russ. Reich. **2** : 58 (1834).

Rose River valley, alpine slopes east of Mile 77, elevation 6,000 feet (associated with *L. parviflora*; see this) No. 10944; granite mountain range west of upper Rose River valley opposite Mile 95, alpine slopes 5,000 feet, No. 10198; upper south fork of Macmillan River on shale mountain west of Mile 268, in open timber-line *Abies* forest, No. 11335; northwest end of Itsi Range, south of south fork of Macmillan River, on alpine slopes above timber-line, No. 11382.

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[1] In Buchenau, l.c., p. 122, the leaves of *L. arctica* (*nivalis*) are described as being "usque 3·5 mm. lata."

Occasional near timber-line, in alpine sphagnum bogs on mountains, particularly along the northern part of Canol Road.

Although specimens intermediate between *L. Wahlenbergii* and *L. parviflora* may be found and in the herbarium are sometimes difficult to distinguish, the latter is essentially a woodland species, whereas *L. Wahlenbergii* almost invariably grows in sphagnum bogs and in the field looks very distinct. Its seeds are greyish brown with a rough, wrinkled testa, whereas those of *L. parviflora* are deeper brown, slightly smaller, and quite smooth.

In Yukon the species is late flowering, and not until the end of August were mature seeds noted (No. 11335).

New to the flora of Yukon.

LILIACEAE

Tofieldia coccinea Richards. in Bot. App. Frankl. Journ. 736 (1823).

Kluane Lake, Burwash Landing, above timber-line, 6,000- to 7,000-foot elevation, Clarke, No. 214.

Strangely enough, *T. coccinea*, which is common in adjacent parts of Alaska and Northwest Territories, has been collected nowhere else in the territory and was absent in numerous suitable places on high mountains along Canol Road until we crossed the Yukon-Mackenzie Divide.

Tofieldia glutinosa (Michx.) Pers., Syn. **1** : 399 (1805).

It is strange that neither this nor the very closely related *T. occidentalis* has been collected in the territory. The latter, according to Hult., Fl. Al. and Yukon **3** : 446 (1943), is found in the Pacific Coast districts of Alaska. *T. glutinosa* is common on calcareous soils of adjacent Northwest Territories and northern British Columbia north to Liard Hot Springs and elsewhere along the Alaska Highway almost to the Yukon border.

Tofieldia pusilla (Michx.) Pers.; Hult., Fl. Al. and Yukon **3** : 444, 447 (1943).

T. palustris auctt.

Lower Lapie River crossing, in boggy places by a lake near Mile 132, No. 9564; south shoulder of Mount Sheldon, in a *Scirpus caespitosus* bog, No. 11670.

Although rather uncommon in the region, the species was observed from nearly all stations where plants were collected and almost invariably in a certain type of *Scirpus caespitosus* bog.

Zygadenus elegans Pursh; Hult., Fl. Al. and Yukon **3** : 449 (1943).

Johnson Crossing, Mile 0, growing as a weed by roadsides, M. P. and R. T. Porsild, No. 472; alpine meadows of granite mountain range west of upper Rose River, Mile 95, elevation 5,600 feet, No. 10555; Rose-Lapie River pass, uncommon in a spruce bog near Mile 105, No. 9291; rocky scree of shale mountain east of Lapie Lake, Mile 105, elevation 5,500 feet, No. 10883; lower Lapie River crossing, in open, dry spruce woods near Mile 132, No. 9678; south shoulder of Mount Sheldon on grassy slopes above timber-line, 4,500 feet, No. 11598; rocky ledges on southeast face of Mount Sheldon, No. 11739; Macmillan Pass, Mackenzie-Yukon Divide, in alpine, treeless country north of road, Mile 284, No. 11220.

A common species along the Canol Road collected or noted from all stations between Whitehorse and Macmillan Pass and usually found on dry, sunny slopes from low level to 6,000 feet (Lapie River crossing). It was noted in flower from June 20 to August 7, and fully mature fruits were not seen until the end of August. The fully expanded flowers emit an unpleasant odour reminiscent of chlorinated lime. Although the species is considered a decided calciphile, it was not infrequently seen on acid granitic rocks.

Veratrum Eschscholtzii A. Gray in Ann. Lyc. Nat. Hist. N.Y. **4** : 119 (1837).

Pass between Teslin and Nisutlin Rivers, in alpine meadows near snowflushes of granite mountain east of Mile 10, elevation 5,000 feet, No. 11035; alpine slopes and snowflushes of granite mountain west of upper Rose River, Mile 95, elevation 5,500 feet, Nos. 10199 and 10557; steep west slope west of Mile 95, in alder thicket by a brook, No. 10498; south shoulder of Mount Sheldon, in open *Abies* scrub near timber-line, 4,500 feet, No. 11599; southeast slope of Mount Sheldon, elevation 5,500 feet, No. 11740; upper south fork of Macmillan River on shale mountain west of Mile 268, snowflushes, No. 11341.

Along the Canol Road *Veratrum Eschscholtzii* is a common species north to Macmillan Pass on snowslides and near snowflushes and in alpine meadows where the snow remains late and where, therefore, a continuous water supply is assured throughout the season. In consequence, the species flowers late and in unfavourable years does not mature fruits. On upper Rose River it was first observed in flower on a sunny slope on July 18 and in a similar place on Mount Sheldon had commenced fruiting on August 11.

Veratrum Eschscholtzii is one of the most ornamental and showy of the Yukon "alpines." The fully mature, fresh, greyish green leaves may measure 18 inches in length with a blade 12 inches long and 6 inches wide. Tall flowering specimens measured 5 to 6 feet.

The young shoots are eaten by the Yukon Indians and when cooked are very tender and palatable and apparently not poisonous, as is the plant of southern Alberta and British Columbia.

New to the flora of Yukon.

Allium Schoenoprasum L. var. **sibiricum** (L.) Hartm.; Hult., Fl. Al. and Yukon **3** : 453 (1943).

Johnson Crossing, Mile 0, on shore of Teslin Lake, M. P. and R. T. Porsild, No. 584. River-banks and alluvial flats along west bank of Nisutlin River, near Mile 36, No. 10771.

The species was seen nowhere else and in Yukon probably is restricted to the lowland along the main river systems. Our specimens were 40 cm. tall and had immature fruits during the last week of July.

Fritillaria camschetcensis (L.) Ker-Gawl. in Curtis's Bot. Mag. 30 (1809).

Haines Road, Mile 85, Clarke, No. 545.

New to the flora of Yukon.

Lloydia serotina (L.) Rchb.; Hult., Fl. Al. and Yukon **3** : 456 (1943); Porsild, Sargentia **4** : 25 (1943).

In the Yukon recorded only from the Arctic Coast, but in Alaska known from mountains of the interior.

Smilacina stellata (L.) Desf.; Hult., Fl. Al. and Yukon **3** : 459 (1943).

Whitehorse, shaly bluff east of Lewes River in an open aspen grove, No. 9138; alluvial flat along west bank of Nisutlin River near Mile 36, No. 10770; lower Lapie River crossing, in aspen thickets in ravines of steep, sunny lower slope of mountain west of Mile 132, Nos. 9435 and 9459.

Apparently restricted to calcareous soils of the southern part of the area where it grows in ravines of sunny slopes. At Whitehorse the species flowered during the first days of June.

Smilacina trifolia (L.) Desf. in Ann. Mus. Paris **9** : 52 (1807).

This species so far has not been collected in Yukon proper but is found along the Alaska Highway almost to the border at Liard Hot Springs, A. E. Porsild, No. 9058, and from adjacent Northwest Territories.

Streptopus amplexifolius (L.) DC. in Lam. & DC. Fl. Fr. **3** : 174 (1805).

Pass between Teslin and Nisutlin Rivers, in alpine meadows near snowflushes on granite mountain east of Mile 10, No. 11036; steep, west slope east of Mile 95 on upper Rose River, elevation 5,000 feet, No. 10497; alpine "flower gardens" west of Mile 95, 5,600-foot elevation, No. 10556; south shoulder of Mount Sheldon, in alpine timber-line meadows, 4,500-foot elevation, No. 11600.

Numbers 11036, 11600, and 10556 are var. *denticulatus* Fassett (*See* Rhod. **37** : 97-102 (1935)), and No. 10497, which grew only a few miles across the valley from No. 10556, is var. *americanus* Schultes.

In southeast Yukon, *Streptopus amplexifolius* was always found associated with *Veratrum Eschscholtzii*, but less common, and restricted to similar habitats. The species was first noted in flower on July 17 and on Mount Sheldon still flowered on August 7, which suggests that it may not produce mature fruits except in favourable years. New to the flora of Yukon.

IRIDACEAE

Iris setosa Pall. ssp. **interior** (E. Anders.) Hult., Fl. Al. and Yukon **3** : 465 (1943).

Southeastern Yukon: Snag Air Station, along old wood road in fairly open, marshy country, July 2, 1944, G. A. Noel (Can).

The present collection extends the known range of the inland race of *Iris setosa* to southwestern Yukon.

Sisyrinchium angustifolium Miller, Gard. Dict. ed. 8 (1768).

Alaska Highway, junction of Haines Road, Clarke, No. 314.

The material differs in no way from typical *S. angustifolium*. New to the flora of Yukon.

ORCHIDACEAE

Cypripedium guttatum Sw.; Hult., Fl. Al. and Yukon **3** : 468 (1943).

In Yukon collected a number of times along Yukon River; along the Alaska-Yukon boundary, latitude 65° 58′, by D. D. Cairnes, Nos. 12 and 13; in latitude 67° N., by Nelles, No. 21; and in the Peel River basin, Camsell, Can, No. 67892.

Cypripedium parviflorum Salisb. in Trans. Linn. Soc. **1**: 77 (1791).

> *C. montanum* Macoun in Ann. Rept., Geol. Surv., Canada, N. Ser. **3** : 226B (1889); Hult., Fl. Al. and Yukon **3** : 469 (1943), not Dougl.
>
> *C. pubescens* Macoun in Geol. Surv., Canada, Mem. **67** : 14 (1914). Alaska-Yukon boundary, latitude 65° 58′, July 29, 1912, D. D. Cairnes, Can, No. 83064.

Macoun's record of *C. montanum* was based upon specimens of *C. passerinum,* collected on Lewes River, Ogilvie, Can, No. 27083. His *C. pubescens,* collected by Cairnes and cited above, is typical *C. parviflorum.*

Apparently a rare species in the Yukon but rather common in adjacent British Columbia (Liard Hot Springs, Porsild, No. 9061) and Northwest Territories.

Cypripedium passerinum Richards.; Hult., Fl. Al. and Yukon **3** : 469 (1943).

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 10660; open spruce forest on alluvial flat along west bank of Nisutlin River near Mile 36, No. 10773; Rose-Lapie River pass, in thickets along rocky chimneys on mountain west of Mile 118, elevation 4,500 feet, No. 10115; lower Lapie River crossing, Mile 132, in peaty soil in open spruce bog, Nos. 9257 and 9825 (with *Orchis rotundifolia*). Also known from Mayo and from Kluane Lake.

Perhaps overly impressed by the comparatively large number of stations from the interior of Alaska and Yukon, Hultén, l.c., p. 470, ventures that *Cypripedium passerinum* is "common in the interior of our area, also far northwards." Actually this is by no means the case, for it is rather narrowly restricted throughout its range to certain lowland habitats on calcareous soils. In Yukon it appears to be limited to the valleys of the large river systems. Along Canol Road it was rare and occasional north to Pelly River, and in the Mackenzie district it extends north only to Norman and to the south arm of Bear Lake. At Lapie Crossing it flowered on June 22 and at Whitehorse had almost mature fruits on July 28.

Orchis rotundifolia Banks ex Pursh.; Hult., Fl. Al. and Yukon **3** : 471 (1943).

Lower Lapie River crossing, in peaty soil in open spruce bog near Mile 132, No. 9258; same place, in rich poplar woods, No. 9565. Also upper Yukon and Dawson Districts.

Apparently a rare species of similar local distribution as the preceding, with which it is often associated. On Canol Road it was seen only as stated; the first expanded flowers were noted on June 10.

Habenaria dilatata (Pursh) Hook., Exotic Fl. **2**, tab. 95 (1824).

Platanthera dilatata Hult., Fl. Al. and Yukon **3** : 476 (1943).

Besides a specimen from Whitehorse, Macoun, Can, No. 65659, this species has recently been collected in the MacArthur Range by Hugh Bostock, No. 159.

Habenaria hyperborea (L.) R. Br. in Ait. Hort. Kew. ed. 2, **5** : 193 (1813).

Platanthera hyperborea Hult., Fl. Al. and Yukon **3** : 479 (1943).

Whitehorse, Anderson, No. 9559; Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 319, 554, and 624; alluvial flats west of Nisutlin River, in open spruce forest opposite Mile 36, No. 10774; lower Lapie River crossing, Mile 132, open spruce forest, No. 9987; Pelly River valley, Mile 136, boggy lake shore, Nos. 9641, 9652, 9771, 9848, and 9885. In addition the species was noted on the upper Rose River, Mile 95. Also from Mayo district, Bostock, No. 205; ibid., Anderson, No. 9714; Yukon River, Selkirk, Malte, No. 85; idem, Dawson, No. 84; Kluane Lake, Clarke, No. 151; Haines Road, idem, No. 313; White River, Anderson, No. 9231.

Restricted to lowland stations along the river systems in the southern part of the area where it was of very local distribution. Specimens on Pelly River flowered the second week of June and on Nisutlin River had almost mature fruits on July 23.

Habenaria obtusata (Pursh) Richards. in Bot. App. Frankl. Journ. 750 (1823).

Platanthera obtusata Hult., Fl. Al. and Yukon **3** : 480 (1943).

Whitehorse, hillsides east of Lewes River, in a bog, No. 10661; Johnson Crossing, M. P. and R. T. Porsild, Nos. 319, 554, and 624; alluvial flats west of Nisutlin River, Mile 36, in boggy places in open spruce forest, No. 10775; lower Lapie River crossing, Mile 132, in peaty soil in open spruce forest with *Orchis rotundifolia*, No. 9259; same place, in a muskeg, No. 9536; same place, in rich poplar woods, No. 9568. In addition noted from Mile 112, 115, and 118 in the Rose-Lapie River pass. Also from Mayo district, Bostock, Nos. 44, 45, and 204; Kluane Lake, Clarke, No. 215; White River, Anderson, No. 9232.

A common species throughout Yukon in moist, cool spruce forests of the lowland; on Canol Road it was not observed north of Pelly River. At Lapie Crossing the first expanded flowers were noted on June 10.

Spiranthes Romanzoffiana Cham. & Schlecht.; Hult., Fl. Al. and Yukon **3** : 485 (1943).

Whitehorse, M. P. and R. T. Porsild, No. 271; Johnson Crossing, Mile 0, idem, No. 733; alluvial west bank of Nisutlin River opposite Mile 36, No. 10776; south shoulder of Mount Sheldon, in a *Scirpus caespitosus* bog where very scarce, elevation 4,200 feet, No. 11671. Also from Mayo District, Bostock, Nos. 40 and 41, and White River, Anderson, No. 9254.

Apparently rare and of very local distribution. Our specimens flowered on July 23 on Nisutlin River.

Listera borealis Morong; Hult., Fl. Al. and Yukon **3** : 486 (1943).

Alluvial flats west of Nisutlin River, Mile 36, in open spruce forest‘ No. 10777; steep, densely wooded east shore of Quiet Lake, Mile 55-60, No. 11111; upper Rose River valley; Mile 95, in spruce forest on river-flat, No. 10356; Rose-Lapie River pass, forested moraines at foot of mountain east of Mile 118, No. 10117; lower Lapie River crossing, Mile 132, in open spruce forest, Nos. 9260 and 9502; same place in rich poplar woods, No. 9566. Also from Mayo District, Bostock, No. 43; Teslin Lake, Anderson and Brown, No. 9984, and from White River, Anderson, No. 9230.

Occasional in lowland spruce and poplar woods; not observed north of Pelly River by us. On Lapie River the species was first observed in flower on June 10.

Listera cordata (L.) R. Br. in Ait. Hort. Kew. 5 ed. **2** : 201 (1813).

Northeast shoulder of Mount Sheldon, in an alpine meadow near timber-line, elevation 4,200 feet, No. 11066.

The species was very scarce and only a few specimens could be found. This species and *Spiranthes Romanzoffiana,* of which a single plant was found also on Mount Sheldon, are the only two orchids noted along Canol Road north of Pelly River. The specimens, which were just past flowering on August 13, do not differ in any way from typical *L. cordata.* New to the flora of Yukon but known from the Pacific Coast of Alaska and from adjacent British Columbia at Liard Hot Springs, Porsild, No. 9062.

Goodyera repens (L.) R. Br. var. **ophioides** Fern.; Hult., Fl. Al. and Yukon **3** : 490 (1943).

Lower Lapie River crossing, Mile 132, in rich poplar woods, No. 9824; Pelly River valley, in duff under spruce trees near Mile 136, No. 9847. Also from Kluane Lake, Anderson, No. 9406, and from White River, idem, No. 9233.

Our specimens were still in bud on June 23. Apparently a rare species in southeast Yukon, seen nowhere else by us but recorded twice from upper Yukon River.

Corallorrhiza trifida Chat.; Hult., Fl. Al. and Yukon **3** : 492 (1943).

Whitehorse, uncommon in pine and spruce woods east of Lewes River, No. 9139; in open spruce woods on alluvial flat west of Nisutlin River, Mile 36, No. 10772; lower Lapie River crossing, Mile 132, open sunny slope, Nos. 9261 and 9503; same place, in open spruce woods, No. 9525; same place, on dry river benches, No. 9567; Pelly River valley, Mile 136, in open spruce woods, No. 9651. Also noted from Mile 95, on upper Rose River and from Rose-Lapie Pass, Mile 115 and 118. Also from Mayo district, Bostock, No. 160; Kluane Lake, Clarke, No. 216, and Duke River, June 20, 1944, C. W. Huddelson.

On Lapie River the species flowered on June 10 and on Nisutlin River had almost mature fruits on July 23.

Not uncommon in the lowland along the Canol Road north to Pelly River where it almost invariably is associated with *Dryas*.

Calypso bulbosa (L.) Rchb.; Macoun, Ott. Nat. **13** : 216 (1899); Hult., Fl. Al. and Yukon **3** : 494 (1943).

According to Macoun this species was collected by J. B. Tyrrell on Chandindu River in Dawson District. The specimen is not in the National Herbarium of Canada, nor has the species been collected in the Yukon by recent collectors, although there are several collections extant from northern British Columbia and from Alaska.

SALICACEAE

Populus tacamahacca Mill.; Hult., Fl. Al. and Yukon **3** : 495 (1943).

Whitehorse, occasional on the banks of Lewes River, No. 10636; river-banks west of Nisutlin River, Mile 30-42, No. 10778; upper Rose River, elevation 3,600 feet, Mile 95, No. 10357; gravelly river-flats of lower Lapie near Mile 127, No. 10011; lower Lapie River crossing, Mile 132, No. 9569; valley of the south fork of Macmillan River, Mile 240-250, No. 11420.

A common and sometimes dominant species on well-drained alluvial lowland soils along the Canol Road north to the west end of Macmillan Pass. In favoured places in Pelly Valley and on lower Lapie River, poplars 60 feet high measured 19 inches in diameter at breast height. In some places poplars grow together with white spruce or alpine fir.

At Lapie River crossing the species was reported in leaf during the last week of May, and at the time of our arrival fruiting specimens were no longer obtainable. The only fruiting specimens seen during the entire season came from a tree that had been felled in May on a gravel bar on lower Lapie River. Although completely cut off from all water supply since June 1, when the spring flood receded, the free branches of the tree had developed normal foliage and flowers and on June 27, retarded about 3 weeks, had produced fully ripe capsules that opened while in the plant presses.

Populus tremuloides Michx.; Hult., Fl. Al. and Yukon **3** : 496 (1943).

Whitehorse, common on dry banks of Lewes River, No. 9162; upper Rose River, Mile 95, on old burns, No. 10450; Pelly River valley, Mile 136-138, No. 9653; alluvial flats of south fork of Macmillan River, Mile 250, No. 11421.

Along the Canol Road *P. tremuloides* is a common species often dominant on dry, burnt-over slopes north to Mile 250 on Macmillan River. On Mount Sheldon it formed a low shrub on dry slopes at 4,000 feet elevation but did not reach timber-line.

Like *P. tacamahacca, P. tremuloides* flowers very early, and fruiting specimens were not seen. Its best development was reached on the lower slopes of Mount Sheldon in open mixed forest of spruce and fir where trees 40 feet high, with trunks 10 inches in diameter, were noted.

Populus trichocarpa T. & G. in Hook. Icon. Pl. 9 : tab. 878 (1852).

According to Hultén, Fl. Al. and Yukon, map 402, and p. 498, this species is restricted to coastal south and southeast Alaska, and specimens from the interior of Yukon, collected by Dawson and recorded by Macoun

(Ann. Rept., Geol. Surv., vol. **3**, 1889), he assumes are *P. tacamahacca.* However, the specimen upon which Macoun's statement was based is preserved in the National Herbarium, Ottawa, and certainly is good *P. trichocarpa.* It consists of a twig with very young leaves and female catkins with young and very hirsute capsules. It is labelled "Pelly Banks, lat. 61° Y.T., July 3, 1887, Dawson." Pelly Banks, which is not shown on modern maps, was on upper Pelly River, actually in latitude 61° 50′. The extraordinarily late date of flowering is noteworthy and possibly significant, because the species here grew far north of its normal range. Compare notes under *P. tacamahacca.*

In the field, the writer suspected the presence of *P. trichocarpa,* chiefly on the grounds of phenological differences, on Pelly and Lapie Rivers, but through lack of fruiting specimens the question could not be settled.

SALIX

PENTANDRAE Dum.

Salix lasiandra Benth. var. **lancifolia** (Anders.) Bebb; Hult., Fl. Al. and Yukon **3** : 503 (1943).

River-banks and alluvial flats west of Nisutlin River, Mile 36-42, No. 10792; Rose-Lapie River pass, gravelly banks of small tributary to Lapie River near Mile 118, No. 10118; Lower Lapie River, gravelly river-flat, Mile 127, No. 10013.

Apparently a rare species seen only in the Pelly Range where it grew on gravelly river-flats to elevations of 4,000 feet. In the Lapie Pass the species flowered on June 27, and on Nisutlin River fruiting specimens were seen on July 28. In Yukon previously recorded from Yukon Valley.

LONGIFOLIAE Anders.

Salix interior Rowlee; Hult., Fl. Al. and Yukon **3** : 504 (1943).

In Yukon recorded from Frances River on the upper Liard drainage and from Dawson district. The species is characteristic of lowland river-bars and was not seen along the Canol Road.

RETICULATAE Fr.

Salix reticulata L.; Hult., Fl. Al. and Yukon **3** : 505 (1943).

Whitehorse, scarce in open spruce swamps on sandy soil on hillsides east of Lewes River, No. 9153; Rose-Lapie River pass, grassy slopes above timber-line on mountain east of Mile 105, elevation 6,000 feet, No. 9390; same place, in open spruce forest near the river, No. 9309; Rose-Lapie River pass, granite schist mountain west of Mile 118, rocky chimney above timber-line, elevation 4,000 feet, No. 10124; south shoulder of Mount Sheldon, grassy slopes above timber-line, elevation 4,500 feet, No. 11602.

One of the most common willows, noted wherever plants were collected. The species grows in not too wet places, especially on the gravel bars of mountain streams and on grassy slopes above timber-line. On Mount Sheldon it ascends to 6,100 feet.

The underside of the very young leaves and, to a lesser degree, the upper surface are covered by a caducous, fluffy white, silky pubescence. At Whitehorse *S. reticulata* flowered the first days in June and in Pelly Range, at 6,000 feet elevation, on June 10.

ALIENAE Flod.

Salix Setchelliana Ball; Hult., Fl. Al. and Yukon **3** : 507 (1943).

South end of Kluane Lake, Anderson, No. 9493.

MYRTOSALIX Kern.

Salix Chamissonis Anders. x ? **arctica** Pall.

Macmillan Pass, Mackenzie-Yukon Divide, in alpine, treeless tundra flats, elevation 5,000 feet, No. 11222.

Our plant differs from typical *S. Chamissonis* by having oblanceolate rather than obovate leaves with acute rather than obtuse or retuse apices. A few leaves are distinctly serrulate, whereas most are merely crenulate. Otherwise, in general appearance, the plant matches material of typical *S. Chamissonis* from Alaska and from its nearest known stations in the Richardson Mountains west of Mackenzie Delta, Northwest Territories (Porsild, 6781 and 7329). The capsules of the over-mature but apparently normal female aments are thinly pubescent; the styles are very long.

Salix pseudopolaris Flod. in Vet. Akad. Arkiv f. Bot. 20A, **6** : 8 (1926).

S. polaris var. *selwynensis* Raup in Contr. Arnold Arb. **4** : 144 tab. 4 (1937).

S. polaris ssp. *pseudopolaris* Hult., Fl. Al. and Yukon **3** : 510 (1943).

Pass between Teslin and Nisutlin Rivers, mountain east of Mile 14, Nos. 10985 and 10989; alpine slopes of mountain east of upper Rose River opposite Mile 95, elevation 5,600 feet, Nos. 11925 and 11926; Rose-Lapie River pass, rocky summit of mountain east of Mile 105, elevation 6,000 feet, No. 9389; rocky summit of granite mountain west of Mile 116, No. 10057; on snowflush in rocky chimneys of mountain west of Mile 118, Nos. 10122 and 10123; rocky summit of mountain south of lower Lapie Crossing, Mile 132, elevation 6,000 feet, No. 9918; moist ravines on south and east slopes of Mount Sheldon, elevation 5,000 feet, No. 11767; grassy and rocky slopes of south shoulder of Mount Sheldon, Nos. 11603, 11606, and 11607, northeast shoulder, No. 11067.

Our plant certainly is identical with *S. polaris* var. *selwynensis* Raup from Mount Selwyn on upper Peace River and also with the plant of Alaska that Hultén, l.c., considers to be *S. polaris* ssp. *pseudopolaris.* Although Hultén does not give *S. polaris* var. *selwynensis* as synonym, he includes Mount Selwyn, B.C., in the range of his ssp. *pseudopolaris. S. pseudopolaris* Flod. antedates *S. polaris* var. *selwynensis* Raup, and although our plant is consistently larger in all parts than the plant described by Floderus from Kamtchatka, there can be little doubt that these represent one and the same species.

According to Hulten, ssp. *pseudopolaris* is so close to *S. polaris* that it can only be considered a "not too distinct geographical race." In typical *S. polaris,* as exemplified by J. E. Enander, Salices Scandinavicae Exsiccatae, Nos. 11 a-g and 12 a-g, the leaves are orbicular and almost entirely glabrous, averaging slightly over 1·0 cm. in diameter; the female aments are rarely over 2·0 cm. long with from 6 to 14 capsules. In our large series the mature leaves are oblanceolate to obovate with cuneate bases, averaging 2·5 x 1·5 cm. (4·0 x 2·2 cm.) with more or less persistent long, wavy white hairs along the margins and on the petiole; the mature female aments average 3·0 cm. in length with from 10 to 25 capsules. In some of our material the capsules are reddish brown and almost entirely glabrous and thus approach the undoubtedly closely related *S. stolonifera* Cov., whereas in the majority the capsules are covered by an investment of soft grey hairs.

Salix pseudopolaris in southeastern Yukon is ubiquitous on all mountains in Pelly Range where the species grows above timber-line on snowflushes, by alpine brooks, or in general in such places where in the eastern Arctic *S. herbacea* would be found. North of the Pelly an isolated population was found on Mount Sheldon, which differed by its more robust habit (Nos. 11603, 11606, 11607, 11067, and 11767).

Along the Canol Road *S. pseudopolaris* flowered from the middle of June, and mature fruits were seen from mid-July to mid-August. The species undoubtedly hybridizes with *S. arctica* with which it is nearly always associated (No. 10123). The Mount Sheldon population may represent such hybrid stock.

Salix phlebophylla Anders.; Porsild, Sargentia **4** : 28 (1943); Hult., Fl. Al. and Yukon **3** : 511 (1943).

In the Yukon this tiny willow has been recorded only from Herschel Island on the Arctic Coast; on the other hand, it was very common on the calcareous rocks of Mackenzie Mountains east of Yukon boundary (Porsild, Nat. Mus. Canada, Bull. **101** : 18 (1945)) and may be expected to turn up also in Ogilvie Mountains and elsewhere in northern Yukon.

ARCTICAE Rydb.

Salix arctica Pall.; Hult., Fl. Al. and Yukon **3** : 513 (1942).

Pelly Range, grassy summit of mountain south of Lapie River crossing, Mile 132, Nos. 9417, 9602, and 9917; Mount Sheldon, on a rocky scree on the south shoulder, Nos. 11608 and 11609; south slope, in a rocky canyon, No. 11766; northeast shoulder, rocky slope of glacial cirque, Nos. 11068, 11070, and 11071.

Salix arctica in southeast Yukon is a very variable species and may be divided into two more or less distinct populations. The plant represented by the above series is more or less typical *S. arctica* and is common on high mountains in the northern part of the area but was not seen south of Lapie River; it flowers in the early part of June or about 2 weeks earlier than the more southern and larger-leaved plant listed below. It is often associated with *S. pseudopolaris* with which it probably hybridizes (*See* notes under that species).

The plant represented by the series listed below is characterized by much larger leaves which, unlike those of the first series, together with the young twigs turn black in drying, by long and stout pistillate aments on long and large-leaved peduncles, by more pointed and much paler pistillate scales, and by late flowering. The material in this series may be considered intermediate between *S. arctica* and *S. crassijulis* Trautv. and differs from the latter chiefly by its smaller acute rather than ovate and obtuse leaves. This plant was common on high mountains of southern part of the area where it occurred as a low, straggling shrub above timber-line. It flowered during the first week of July, fully 2 weeks later than did typical *S. arctica.*

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, Nos. 10988 and 10990; Pelly Range, alpine slopes east of Rose River, Mile 77, Nos. 10947 and 10948; dry south slope of granite mountain east of Mile 85-90, No. 10165; alpine, rocky slopes west of Mile 95, Nos. 10558, 10560, and 10562.

In Yukon *S. arctica* previously had been recorded only from the Arctic Coast.

Salix torulosa Trautv.; Hult., Fl. Al. and Yukon **3** : 519 (1943).

Several of the specimens here listed under *S. arctica* resemble specimens in the National Herbarium of Canada, from Dawson district, which by Hultén have been referred to *S. torulosa.* They all have orbicular, black scales and seem best placed with *S. arctica.*

OVALIFOLIAE Rydb.

Salix stolonifera Cov. in Proc. Wash. Acad. Sci. **3** : 333 (1901).

Kluane Lake, Burwash Landing, above timber-line, 6,000 to 7,000 feet elevation, Clarke, No. 217.

New to the flora of Yukon.

GLAUCAE Fr.

Salix glauca L.; Hult., Fl. Al. and Yukon: **3** : 525 (1943).

Whitehorse, common on river-flats of Lewes River, Nos. 9142 and 9143; Rose-Lapie River pass, river-flat near Mile 105, Nos. 9244, 9304, 9305, 9306; southwest slope of granite mountain west of Mile 116, on alpine slopes above timber-line, Nos. 10055 and 10056.

Our Whitehorse specimens flowered during the first days of June and those in Rose-Lapie pass, at 3,600 feet elevation, on June 10. It was noted that in local populations or clones the male plant flowered about a week later than the female. Typical *S. glauca* apparently is restricted to the southern part of the area and was not seen north of Rose-Lapie Pass.

Specimens suggestive of hybrid origin may be seen in most large populations of *S. glauca.* The specimens in the following series are probably all hybrid.

Lower Lapie Crossing, river-banks near Mile 132, No. 9513, the young leaves are silky pubescent and glandular serrate, whereas the mature ones are almost glabrous and entire; the immature capsules are poorly developed and glabrescent; south shoulder of Mount Sheldon, low erect shrub in timber-line forest, No. 11610, the specimens are those of the male plant with recently wilted aments on August 7.

Salix glauca L. var. **acutifolia** Schn. in Bot. Gaz. **66** : 327 (1918) and **67** : 60 (1919).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 10-14, No. 10987; lower Lapie River, gravelly river-flats near Mile 127, No. 10012; same place, in a muskeg near Mile 132, No. 9829; Mount Sheldon, in a ravine on south slope near timber-line, elevation 5,000 feet, No. 11713; valley of the south fork of Macmillan River, in swampy river-flats near Mile 250, No. 11414; Macmillan Pass, Mackenzie-Yukon Divide, in gravelly river-flat, elevation 4,600 feet, No. 11225.

Within our area *S. glauca* var. *acutifolia* is common or even ubiquitous in well-drained river-flats subject to spring floods, where it forms thickets 6 to 9 feet high. It flowers later here than does the main species and is one of the latest willows to mature fruits. On Macmillan River its capsules were only beginning to open during the last week of August.

Salix glauca var. **perstipula** Raup in Sargentia **6** : 154, fig. 13 (1947).

Whitehorse, 6-foot shrubs along Lewes River, Nos. 9150 and 9152; alluvial flats west of Nisutlin River near Mile 36-42; No. 10787; upper Rose River, old burns east of Mile 95, No. 10470; Rose-Lapie River pass, marshy river-banks near Mile 105, No. 9331; lower Lapie River crossing, dry lower slope of mountain west of Mile 132, open spruce forest, No. 9462; same place, river terraces, Nos. 9511 and 9512; alpine tundra on upper slopes of mountain south of Mile 132, 4,500-foot elevation, No. 9919; 9-foot bushes on gravelly river-flat near Mile 132, Nos. 9988 and 9989; Pelly River valley, on a dry slope near Mile 136, Nos. 9656 and 9773.

Along the Canol Road var. *perstipula* occupied the same area as var. *acutifolia* with which it was often associated. Like it, it flowers and fruits late.

Salix brachycarpa Nutt. var. **Mexiae** Ball; Hult., Fl. Al. and Yukon **3** : 529 (1943).

Pelly River valley, dry, sunny slopes south of Pelly Crossing, Nos. 9775 and 9777.

Apparently a rare species in southeast Yukon, not seen elsewhere by us but previously recorded from Whitehorse and Dawson.

Salix niphoclada Rydb.; Hult., Fl. Al. and Yukon **3** : 530 (1943).

Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, a low, erect shrub growing on rocky ledges at 4,500-foot elevation, No. 10125; lower Lapie River crossing, dry upper slopes of shale mountain west of Mile 132, low, erect, 1- to 2-foot shrubs which formed small, dense thickets on a dry slope above timber-line, elevation 5,500 feet, No. 9716.

Our specimens are less pubescent than the type from lower Mackenzie River (Taylor, No. 60, Can) and flowered in the third week of June. In Yukon previously recorded from Whitehorse and Kluane Lake.

Salix Muriei Hult., Fl. Al. and Yukon **3** : 531 (1943).

Of this species, recently described from central Alaska, Hultén records a single collection from Yukon: Dawson Slide, Eastwood, No. 161 (US).

CORDATAE Barr.

Salix mackenzieana Barratt apud Anders. in Sv. Vet.-Akad. Handl. **15** : 125 (1858). *See* Raup in Sargentia **6** : 155 (1947).

Whitehorse, tall shrubs along Lewes River, Nos. 9155 and 10662; Pelly River valley, on a river-flat near Mile 136, No. 9886.

At Whitehorse *S. mackenzieana* flowered on June 1 and on July 28–29 had fully developed capsules. It was previously known north to Simpson on Mackenzie River (Raup), and the present collection, therefore, constitutes a notable extension of the known range.

Salix pseudocordata (Anders.) Rydb., Fl. Colo. 94 (1906). *See* Schneider in Journ. Arn. Arb. **2** : 195-197 (1921).

Lower Lapie River crossing in rich soil by a spring in poplar grove where it formed low bushes 3 feet high, No. 9570. In the collection the male and female plant are represented. It flowered on June 17. Also, south end of Lake Kluane, Anderson, No. 9494, distributed as *S. Barclayi.*

The two Yukon collections listed above are a good match for a large series from Alberta and British Columbia, which, in the National Herbarium of Canada by Raup and Ball, have been annotated *S. pseudocordata.*

Salix pseudocordata is new to the flora of Yukon but may possibly be the plant that Hultén, l.c., p. 538, records from Alaska as *S. myrtillifolia* var. *pseudo-myrsinites* (Anders.) Ball in sched.

HASTATAE Fr.

Salix Barclayi Anders.; Hult., Fl. Al. and Yukon **3** : 533 (1943).

Whitehorse, on bluffs and hillside east of Lewes River, Nos. 9140, 9141, 9158, 9159, and 9160; pass between Teslin and Nisutlin River, elevation 4,000 feet, No. 11135; shelving banks of Nisutlin River, Mile 36-42, Nos. 10784, 10785, and 10786; east slope of Rose River valley, forming thickets by a stream, Mile 77, Nos. 10275, 10276, and 10277; same place, in a spruce bog, No. 10271; granite mountain west of upper Rose River, opposite Mile 95, alpine slope by a stream, elevation 5,000 feet, No. 10202; river-flats along Rose River, Nos. 10358, 10360, and 10475; steep slope east of Mile 95, near timber-line, elevation 5,000 feet, No. 10499; Rose-Lapie River pass, grassy slopes near Mile 102, No. 10610; same place, in wet river-flat, Nos. 9301, 9302, and 9332; alpine slopes east of Mile 105, elevation 6,000 feet, No. 10887; Lapie River, gravelly river-flat opposite Mile 127, No. 10014; northeast shoulder of Mount Sheldon, low bushes by shore of alpine lake, 6,000 feet, Nos. 11072 and 11074; alpine meadows near northeast spur of Mount Sheldon, Mile 226; No. 11465; steep ravines of southeast slope of Mount Sheldon, Nos. 11715 and 11762; in a bog in saddle between Mount Sheldon and Mount Riddell, Nos. 11672, 11764, and 11765; upper south fork of Macmillan River, Mile 268, Nos. 11342 and 11358; Macmillan Pass, Mackenzie-Yukon Divide, No. 11224.

Although previously recorded only once from Yukon, *S. Barclayi* undoubtedly is the most common thicket-forming species in southeast Yukon where it is ubiquitous on well-drained soil on river-flats and by alpine streams on mountain slopes to or slightly above timber-line. It flowered from first week of June and, in favourable places, had matured fruits by mid-June.

Salix Barclayi undoubtedly forms hybrids with several other species. One such possible hybrid is No. 11464 from alpine meadows of the northeast spur of Mount Sheldon where it formed an outside 4- to 5-foot fringe around "islands" of pure *S. planifolia.*

Salix pseudomonticola Ball; Hult., Fl. Al. and Yukon **3** : 535 (1943).

Whitehorse, banks of Lewes River, Nos. 9149 and 9157. Rose-Lapie River pass, Mile 118, bushes 16 feet tall in open spruce forest, No. 10119; lower Lapie River crossing, shrubs 6 feet high in shady woods, No. 9679; Pelly River valley, common in open spruce forest, Nos. 9654 and 9772.

A lowland species of calcareous, alluvial soils; not observed north of Pelly River but apparently common in the Yukon Valley. The species flowers early and at Whitehorse had almost mature fruits the first week in June.

Salix commutata Bebb in Bot. Gaz. **13** : 110 (1888).

Granite mountain range west of upper Rose River opposite Mile 95, in alpine valley, 5,600-foot elevation, No. 10559; south and east slopes of Mount Sheldon, in a steep ravine where the snow remains late, No. 11763; wet, boggy flat in saddle between Mount Sheldon and Mount Riddell, No. 11673; south fork of Macmillan River, Mile 240, by a small stream, Nos. 11413 and 11419; northwest end of Itsi Range, south of Mile 250, on alpine slopes above timber-line, No. 11385; shale mountain west of Mile 268, grassy slope above timber-line, Nos. 11343 and 11344; Macmillan Pass, Mackenzie-Yukon Divide, Mile 284, in a river-flat, No. 11226.

Salix commutata is a common species in alpine meadows near and above timber-line where it often forms small thickets 2 to 4 feet high, often associated with *S. Barclayi* and occasionally with *P. planifolia.* Several numbers in the series, like specimens mentioned by Hultén, l.c., p. 536, from Alaska, have strongly serrulated leaves. Hultén thinks that these may be *S. commutata* x *myrtillifolia.* The most extreme form in the writer's collection, Itsi Range, No. 11985, to the writer suggests *S. commutata* x *Chamissonis.* It is a trailing shrub which grew with typical *S. commutata.* The leaves are almost glabrous and as serrate as in *S. Chamissonis,* and the bark also is as in that species. The outline of the leaves is as in *S. commutata,* and the poorly developed capsules are glabrous and pedicellate.

The species is new to the flora of Yukon but is known from adjacent parts of southeast Alaska, from British Columbia, and from Brintnell Lake in Mackenzie Mountains, N.W.T. (Raup).

Salix myrtillifolia Anders.; Hult., Fl. Al. and Yukon **3** : 537 (1943).

Whitehorse, low, wet ground by Lewes River, No. 9151; alluvial flats west of Nisutlin River, Mile 36-42, Nos. 10780, 10782, and 10789; Rose-Lapie River pass, grassy meadows near headwaters of Lapie River, elevation 3,600 feet, Mile 105, Nos. 9310, 9311, and 10611; same place, east slope of granite-schist mountain west of Mile 118, moist slope by a brook, elevation 5,000 feet, No. 10120; lower Lapie River crossing, Mile 132, No. 9571; Pelly River valley, Mile 136-138, Nos. 9642, 9643, 9644, 9774, and 9779; south fork of Macmillan River, Mile 240-250, elevation 3,300 feet, No. 11415.

Salix myrtillifolia in our region is a very variable species. The specimens in the above series are more or less uniform, all rather low, usually less than one foot high, growing in wet places, often on the sides of hummocks, and apparently restricted to the calcareous soils of river valleys. Thus the species was very common in the valleys of Pelly Plateau but disappeared north of Pelly River to reappear on the calcareous schists of the south fork of Macmillan River.

In the Rose-Lapie River pass the species flowered during the first days of June, whereas in Pelly River valley some specimens had mature capsules on June 15.

CHRYSANTHAE Koch.

Salix Richardsonii Hook.; Hult., Fl. Al. and Yukon **3** : 538 (1943).

Rose River valley, by a small stream, near Mile 77, Nos. 10273 and 10274; granite mountain east of Rose River, Mile 85-90, elevation 5,500 feet, No. 10166; mountain range west of Mile 95, in alpine meadow by a stream, 5,600 feet, No. 10561; Rose-Lapie River pass, wet places on river-flat near Mile 105, Nos. 9292 and 9300; lower Lapie River crossing, open spruce-covered north slope of mountain west of Mile 132, No. 9460; Lapie River crossing, Mile 132, open spruce forest, No. 9267; south shoulder of Mount Sheldon, by a small stream above timber-line, 5,600 feet, No. 11601; northeast shoulder of Sheldon, by the edge of alpine lake, No. 11073. Noted also in upper Macmillan River and in Macmillan Pass.

Salix Richardsonii is a common species on river-flats, by alpine streams, and in open timber-line forest. It was rarely seen below the 4,000-foot level and on Mount Sheldon reached elevations of 5,600 feet. It never formed extensive thickets but usually grew singly or in small clumps 4 to 8 feet high. In the Rose-Lapie Pass, at 3,700-foot elevation, the species was in flower with small young leaves on June 10, whereas on the same date at Lapie River crossing specimens were collected with fully mature fruits (No. 9267). The leaves vary considerably in outline and degree of serration. In No. 9267 the leaves are strongly serrated throughout.

Salix alaxensis (Anders.) Cov.; Hult., Fl. Al. and Yukon **3** : 539 (1943).

Granite mountain range west of Mile 95 on upper Rose River, tall bushes by an alpine stream just above timber-line, elevation 5,000 feet, No. 10201; schist mountain east of Lapie Lake, Mile 105, by an alpine brook in a ravine, elevation 5,500 feet, No. 10888; rocky chimneys of granite-schist mountain west of Mile 118, elevation 5,500 feet, No. 10121; Mount Sheldon, rocky ravine on south shoulder, elevation 5,600 feet, No. 11611. Also noted on mountains of the upper south fork of Macmillan River, at Mile 250 and 268, and in Macmillan Pass.

In southeastern Yukon, *S. alaxensis* is an alpine species which is very rarely, if ever, seen below timber-line. It grows in gravelly, well-watered places by mountain streams and was not seen on the main rivers until near their headwaters.

The species flowers early in June, often while snow or ice still covers the ground and lower part of the trunk. Mature fruits were first collected in Rose-Lapie Pass above timber-line on June 26. The winter buds containing next year's aments are very conspicuous as early as late August and are enveloped in the swollen bases of the leaf petioles.

Hultén, l.c., suggests that intermediate forms between *S. alaxensis* and the var. *longistylis* occur and that the division of the material "sometimes is somewhat arbitrary." The writer, in southeastern Yukon, saw no intermediate forms and believes that *S. longistylis* is taxonomically distinct. *See* discussion of that species.

Salix longistylis Rydb. in Bull. N.Y. Bot. Gard. **2**, 6 : 163 (1901).

S. alaxensis var. *longistylis* Schn. in Journ. Arn. Arb. **1** : 225 (1919); Hult., Fl. Al. and Yukon **3** : 541 (1943).

Whitehorse, common along the banks of Lewes River, Nos. 9145, 9146, 9156, and 9161; shelving banks of Nisutlin River, near Mile 36-42, bushes 6 feet tall, No. 10788; Rose-Lapie River pass, in a flat by upper Lapie River, Nos. 9296, 9297, and 9303; lower Lapie River crossing, Mile 132, bushes from 6 to 18 feet high, in gravel by the river, Nos. 9266 and 9504; same places, bushes 20 feet tall, forming dense undergrowth in poplar grove in rich soil by a spring, Nos. 9830 and 10032; Ross River valley, near north end of Sheldon Lake, Mile 222, tall bushes by riverbank, No. 11538.

Salix longistylis is one of the most common willows in southeastern Yukon where it grows in well-watered gravels along lowland streams. In sheltered places it attains a height of 20 feet, with trunks 5 to 6 inches in diameter. The species flowers already in May; in Rose-Lapie Pass, at an elevation of 3,600 feet, when the snow has only recently disappeared in the valley bottom, its capsules were fully developed on June 10.

Schneider considered *S. longistylis* a variety of *S. alaxensis* in which most subsequent writers have followed him. From his experience with *S. longistylis* in the field the writer feels that for both taxonomical and geographical reasons it should be considered distinct from *S. alaxensis*. The latter is an arctic-alpine species that in North America extends from Bering Strait east to the west coast of Hudson Bay (not western Labrador as stated by Hultén, l.c.), north to Banks and Victoria Islands, south to Bear Lake and Slave Lake, and in high mountains south through Alaska, Yukon to British Columbia, and Alberta. *S. longistylis*, on the other hand, has a much smaller geographical area and is an inland species of low to moderate altitudes, which, apparently, is endemic to Alaska, Yukon, northern British Columbia, and in Mackenzie Mountains barely enters the Northwest Territories. In Alaska it does not reach north or west beyond the coniferous forest.

In southeastern Yukon the writer has seen no intermediate forms between *S. alaxensis* and *S. longistylis*. In fact the latter, in life, does not even closely resemble *S. alaxensis*. In addition to the presence or absence of permanent pubescence on the young twigs, which in the herbarium usually makes the separation of the two species easy, the pistillate bracts, as correctly described by Rydberg, in *S. longistylis* are obovate, obtuse, and almost black. In *S. alaxensis* they are lanceolate or oblanceolate and light brown. The young leaves of *S. longistylis* are not noticeably fragrant, whereas in *S. alaxensis* they are strongly perfumed as in *Populus tacamahacca*.

The characters distinguishing the two species may be summarized as follows:

——	*S. alaxensis*	*S. longistylis*
Habit	Tree-like, with gnarled trunk and branches	Bush-like, with straight branches
Young twigs	Densely yellowish-velvety pubescent	Soon becoming smooth, with bluish bloom
Young leaves	Very fragrant	Not fragrant
Pistillate bracts	Lanceolate-oblanceolate acute, light brown	Obovate-obtuse, almost black
Winter buds	Very large and conspicuous	Not large
Habitat	Arctic-alpine	Low to moderate elevations
Distribution	Bering Strait east to Hudson Bay, in mountains south to Alberta and British Columbia	Endemic to Alaska-Yukon and northern British Columbia

Raup, Contr. Arn. Arb. **6** : 147-9 (1934), in comparing *S. longistylis* with the little known *S. Drummondiana* Barr. of the Canadian Rockies, "is inclined to look upon *S. Drummondiana* as an abnormal form of *S. alaxensis* complex."

Salix Barrattiana Hook., Fl. Bor.-Am. **2** : 146 (1839).

Pass between Teslin and Nisutlin Rivers, subalpine moist slopes east of pass, elevation 4,500 feet, No. 11037; Rose River valley, in a bog near Mile 77, Nos. 10269 and 10272; upper Rose River, in wet, boggy places in river-flat, No. 10362; granite mountain range west of Mile 95 on upper Rose River, in wet places in small alpine valley, elevation 5,600 feet, No. 10563; Rose-Lapie River pass, Mile 98-99, in swampy river-flat, No. 11899; Rose-Lapie Pass, forming low thickets in wet river-flat near Lapie Lake, Mile 105, Nos. 9293, 9294, 9295, 9334, and 11984; in wet swale at head of alpine valley, elevation 5,500 feet, No. 10886; northwest end of Itsi Mountain, south of Mile 250, No. 11386. Also noted as very common on Mount Sheldon, on the upper Macmillan River, and in Macmillan Pass.

In Northwest Territories, Yukon, and Alaska, *S. Barrattiana* is represented by what may prove a distinct race, var. *marcescens* Raup in Sargentia **6** : 157 (1947), distinguished from typical *S. Barrattiana* by persistent stipules and more hirsute twigs. This race also occurs on high mountains of Alberta and British Columbia and apparently is identical with *S. albertana* Rowlee in Bull. Torr. Bot. Cl. **34** : 157 (1907), which Rowlee, l.c., thinks may be *S. Barrattiana* var. *angustifolia* Anders. in DC. Prod. **16**, 1 : 247 (1868).

Salix Barrattiana is common along Canol Road where it forms extensive, low and almost pure thickets on wet, treeless river-flats, in alpine passes, and in well-watered depressions in mountain valleys, from 3,000 to 5,500 feet elevation. The thickets are usually 2 to 4 feet high and very dense and of a very distinctive greyish green colour that can be recognized at a distance. The young twigs are extensively browsed by moose.

Our plant flowers very early, and in the Rose-Lapie Pass fruiting aments were collected on June 10-11 when the leaves were still very small. The staminate aments drop very early and were seen only once (No. 11037). The large series listed shows considerable variation as regards the shape of the leaves which vary from linear-lanceolate to obovate. In the male plant the leaf-bases are cordate or truncate, whereas in the female plant they are cuneate; entire or serrate leaf-margins may be seen in almost any population as shown by the large series from Rose-Lapie Pass.

Characteristic for *S. Barrattiana,* irrespective of leaf variation, is a very peculiar exudation from the bud scales, stipules, and young twigs, which is so abundant that it makes the twigs "oily" to the feel. In the process of drying, this oily substance produces a yellowish stain that in the presses may penetrate two to three thicknesses of newsprint.

The leaves remain on the twigs throughout the winter and are not dropped until the flowers appear in spring.

Discussing *S. albertana,* Rowlee, l.c., mentions a "balsamic odor," still noticeable in herbarium specimens "which in the fresh plant was as strong as that of Balm of Gilead and much like it." In Yukon the species is not noticeably fragrant in life, nor is any fragrance present in the large material before the writer.

Salix Barrattiana, which is new to the flora of Yukon, was recently recorded from Alaska and Northwest Territories, Porsild in Rhodora, **41**: 216 (1939) and Bull., Nat. Mus., Canada **101,** Biol. Ser. **30** : 18 (1945).

CANDIDAE Schn.

Salix candida Flügge apud Willd., Sp. Pl. **4** : 708 (1805).

Whitehorse, occasional to common by streams and river-flats east of town, No. 10663; same place, rare by a lake in foothills east of town, No. 9147.

An eastern species which has not previously been recorded from the Yukon; it appears to be rare and was not observed elsewhere. The nearest known stations are: Liard Hot Springs, northern British Columbia (Porsild, No. 9065), Great Bear Lake, and Great Slave Lake. Our specimens were flowering the first week of June and on July 28-29 had mature fruits.

LIVIDAE Nym.

Salix Bebbiana Sarg.; Hult., Fl. Al. and Yukon **3** : 544 (1943).

Whitehorse, on a river-flat, No. 9154; steep west bank of Nisutlin River, Mile 36, No. 10790; alluvial flats west of Nisutlin River, near Sydney Creek, Mile 30, No. 10781; Rose-Lapie River pass, Mile 105, open spruce forest near Lapie Lake, No. 9243; same place, schist mountains east of Mile 105, in a ravine, No. 10884; lower Lapie River crossing, alluvial flat, Nos. 9509 and 9510; same place, in a muskeg, No. 10031; Pelly River valley, by the edge of a lake, No. 9778; Ross River valley near north end of Sheldon Lake, Mile 222, river-banks, No. 11542.

Salix Bebbiana, like *S. arbusculoides,* is a common species in Yukon Valley and in the southern part of the Canol Road where it favours alluvial river-banks of the lowland. The species was not seen north of Sheldon Lake. In the Lapie Pass it flowered on June 10 and on June 15 on the lower Lapie had immature capsules. On the Canol Road *S. Bebbiana* usually is a shrub 6 to 8 feet high and rarely reaches tree-size (No. 9510).

ROSEAE Anders.

Salix fallax Raup in Contr. Arn. Arb. **6** : 149 (1934), tab. 5.

Lower Lapie River crossing, in an open muskeg near Mile 132, Nos. 9537, 9827, 9828.

Salix fallax was common locally in one muskeg where it grew in rather wet places. The 6-foot bushes flowered on June 15, and on June 22 almost mature capsules were seen. The large material answers the description and plate and is a good match for the type in the National Herbarium, Ottawa.[1] The present collections extend the known range of this species which has long been known only from the type locality on upper Peace River.

Salix pedicellaris Pursh var. **hypoglauca** Fern. in Rhod. **11**: 161 (1909). *See* Schneider in Journ. Arn. Arb. **2** : 81 (1920) and Raup, ibid. **17** : 238 (1936).

Pelly River valley, a low, erect shrub in a muskeg, near Mile 136, No. 9776. Our specimens flowered on June 21.

New to the flora of Yukon.

PHYLICIFOLIAE Dum.

Salix pulchra Cham.; Hult., Fl. Al. and Yukon **3** : 547 (1943).

Pass between Teslin and Nisutlin Rivers, alpine slopes of granite mountain east of Mile 14, Nos. 10986 and 11038; granite mountain range west of upper Rose River, Mile 95, alpine slopes above timber-line, Nos. 10200 and 10203; Rose-Lapie Pass in a spruce swamp on river-flat, No. 9333; lower Lapie River crossing, dry alpine ridge near summit of mountain west of road, elevation 5,000 feet, No. 9715; Mount Sheldon, grassy slopes above timber-line, No. 11604; same place, on rocky ridge, 6,000 feet, Nos. 11069 and 11605; valley of the south fork of Macmillan River, stony river-banks, No. 11418; shale mountain west of Mile 268, on rocky slope above timber-line, No. 11345; same place, straggling shrub on barren, shaly summit, elevation 6,000 feet, No. 11346. Also common in Macmillan Pass.

In southeastern Yukon, *S. pulchra* is a common or even ubiquitous species on alpine tundra above timber-line where it usually forms 2 to 5 feet high thickets. It strongly favours sheltered slopes or hollows along tundra streams where a snow cover is assured but even in such places flowers very early when snow still covers the lower parts of the trunks; in the Rose-Lapie Pass it had immature fruits on June 11.

The specimens in the above series are very uniform and abundantly distinct from the var. *yukonensis* Schn. which the writer thinks might well be considered distinct.

Schneider describes the leaves of *S. pulchra* as being rhomboid-oblanceolate, ovate-oblong, or rhomboid-elliptic, 4 to 6 cm. long and 1·5 to

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[1] The determinations of *S. fallax*, *S. glauca*, and its varieties *acutifolia* and *perstipula*, *S. mackenzieana*, *S. niphoclada*, and *S. pedicellata* var. *hypoglauca* were kindly verified by Dr. Hugh M. Raup.

2·5 cm. broad (Journ. Arn. Arb. **3** : 112 (1921)). In our series the leaves are much narrower and only slightly oblanceolate, averaging 6 x 1 cm. The leaves remain on the twigs throughout the winter, and many still remain well into the following summer (Porsild in Rhod. 41 : 217 (1939)).

Salix pulchra Cham. var. **yukonensis** Schneider in Journ. Arn. Arb. **1**: 72 (1919); Hult., Fl. Al. and Yukon **3** : 548 (1943).

Upper Rose River valley, a dominant species on open burns on spruce-covered slope, No. 10469; Ross River valley near north end of Sheldon Lake, Mile 222, No. 11541; northwest end of Itsi Range, south of Mile 250, No. 11384.

The var. *yukonensis* differs consistently from the species by its much taller growth, being usually 6 to 8 feet high, with larger, distinctly diamond-shaped leaves, averaging 2·0 to 2·5 x 5·0 to 7·0 cm., and by its pubescent twigs; it usually inhabits alluvial banks at low or moderate elevations and was not seen above timber-line; when better understood it probably will prove taxonomically distinct.

Salix planifolia Pursh, Fl. Am. Sept. **2** : 611 (1814).

Whitehorse, forming low thickets 5 to 6 feet high along the Lewes River, No. 9148; shelving banks of Nisutlin River near Mile 36-42, No. 10783; upper Rose River valley, Mile 95, gravelly river-flat, No. 10359; Rose-Lapie River pass, Mile 105, swampy places near the lake, No. 9307; schist mountain east of Rose-Lapie Pass, Mile 105, elevation 5,000 feet, No. 10890; lower Lapie River crossing, Mile 132, open spruce forest, No. 9506; same place, in a muskeg swamp, No. 9572; Ross River valley, near north end of Sheldon Lake, Mile 222, No. 11540; northeast spur of Mount Sheldon, forming "islands" in subalpine meadows, Mile 226, No. 11463; south fork of Macmillan River, Mile 240-250, on river-banks, No. 11417.

Salix planifolia is a common species along the Canol Road where it is generally found along river-banks and in well-drained alluvial soils of low elevation. In the subalpine meadows of the Mount Sheldon and Macmillan River area, *S. planifolia* appeared to be the principal willow invading the grassland. It is an eastern species which has not penetrated far into Yukon where, apparently, it has not been recorded previously. It flowers very early and at Whitehorse had fully developed capsules on June 1-5.

Salix arbusculoides Anders.; Hult., Fl. Al. and Yukon **3** : 549 (1943).

Alluvial flats west of Nusutlin River, dense spruce forest, Mile 36-42, No. 10793; Rose River valley, open pine and spruce woods near Mile 77, No. 10270; upper Rose River, Mile 95, in open spruce forest by the river, No. 10361; Rose-Lapie River pass, Mile 105 near Lapie Lake, Nos. 9298 and 9299; schist mountain east of Mile 105, in a ravine, No. 10885; lower Lapie River crossing, Mile 132, in open spruce forest, No. 9505; south and east slopes of Mount Sheldon, in steep ravines opposite Mile 222, No. 11714.

Salix arbusculoides is a common species in lowland spruce forest of the Yukon Valley and along the Canol Road, becoming progressively scarcer northward. It was seen a few times in the vicinity of Mount Sheldon where it ascended only to 3,500 feet, but was not seen north of there. It flowered in Lapie Pass on June 10, but on the lower Lapie had mature fruits on June 15.

DISCOLORES Barr.

Salix Scouleriana Barratt var. **coetanea** Ball in Journ. Wash. Acad. Sci. **24** : 73 (1943).

S. Scouleriana Hult., Fl. Al. and Yukon **3** : 550 (1943).

Whitehorse, common in open pine forest east of Lewes River, No. 9144; alluvial flats west of Nisutlin River, open spruce forest, Mile 36-42, Nos. 10779 and 10791; upper Rose River, Mile 95, common in old burns, No. 10451; Rose Lapie River pass, Mile 105, in open spruce forest near road, No. 9330; steep east slope of granite-schist mountain west of Mile 118, No. 10126; lower Lapie River crossing, Mile 132, river-banks, etc., Nos. 9507 and 9508; same place, in rich poplar woods by a spring, No. 10033; Pelly River valley, steep, heavily eroded alluvial terraces, Mile 136, No. 9655; Rose River valley near north end of Sheldon Lake, Mile 222, common on lake and river-banks, No. 11539; Macmillan Pass, Mackenzie-Yukon Divide, Mile 284, 4,600 feet, No. 11221.

Salix Scouleriana var. *coetanea* is a common lowland willow along the Canol Road where it is found chiefly in alluvial soils along rivers. It is a primary component of open spruce forest where it is often a slender, tree-like bush, 20 feet high. In Pelly Valley and elsewhere it is often ubiquitous in recent and old burns. *S. Scouleriana* var. *coetanea* flowers very early, and bushes with fully developed pistillate aments and young leaves were collected at Whitehorse on June 1-5 and in the Rose-Lapie Pass on June 15; on the lower Lapie, extensive searches on June 15 disclosed a single tree on which some aments still remained.

In southwestern Yukon, *S. Scouleriana* var. *coetanea* is not very variable but probably forms hybrids with *S. planifolia* (No. 10033). Generally speaking, the adpressed pubescence on the underside of the leaves is less pronounced than elsewhere within the range of the species, and the hairs tend to be white rather than reddish.

MYRICACEAE

Myrica Gale L. Sp. Pl. 1024 (1753).

Mayo district, Big Kalza, Bostock, No. 162; Dawson, August 10, 1916, Malte.

Apparently a rare species in the Yukon where it has not been recorded from elsewhere.

BETULACEAE

Betula glandulosa Michx.; Hult., Fl. Al. and Yukon **4** : 573 (1944).

Whitehorse, common along streams and in swampy places along Lewes River, No. 9163; alluvial flats west of Nisutlin River opposite Mile 36, No. 10794; upper Rose River, forming extensive 4- to 5-foot high thickets, on river-flats in open spruce and fir forest near Mile 95, No. 10363 same place, on a burnt-over slope together with *B. occidentalis*, Nos. 10452 and 10471-A; Rose-Lapie River pass, common in wet spruce flats near

Mile 105, No. 9308; lower Lapie River crossing, edge of spruce forest on lower slope of mountain west of Mile 132, No. 9436; same place, forming dense thickets near timber-line, about 5,000 feet, Nos. 9717 and 9718; Macmillan Pass, Mackenzie-Yukon Divide, forming open thickets on gravelly river terraces and eskers, No. 11232.

A common species throughout our area, ubiquitous on alpine slopes to 6,100 feet and on dry gravelly terraces. At Whitehorse, *B. glandulosa* flowered on June 1.

Notwithstanding Hultén's statement, l.c., that *B. glandulosa* in Alaska-Yukon hybridizes freely with *B. resinifera* [*B. papyrifera* var. *neoalaskana*] (*See* notes under *B. occidentalis*) and also with *B. nana* ssp. *exilis* [*B. glandulosa* var. *sibirica*], I have been unable, in the field, to find evidence of such widespread hybridization. The latter variety is restricted to Bering Strait region and specimens in the National Herbarium, Ottawa, from central Alaska and Yukon, which by Hultén were annotated *B. nana* ssp. *exilis*, are surely all young *B. glandulosa* in which species the early, immature leaves are round, with truncate or cordate bases. Marked specimens at Whitehorse, that in early spring had such leaves, later in the season attained the normal appearance of *B. glandulosa*, with cuneate, toothless leaf bases.

Betula nana is an Old World species, which, from Europe, extends east only to western Siberia and in North America, west of Greenland, is known only from a single station in Baffin Island.

All Alaska material of *B. glandulosa* var. *sibirica* [*B. nana* ssp. *exilis*] completely lacks the velutinous pubescence of the young twigs, so characteristic of *B. nana*, and it is difficult, therefore, to understand why Hultén, l.c., p. 581, considers it "much more closely related to *B. nana* than to *B. glandulosa*." His statement that according to Flora U.S.S.R., "intermediate forms [between *B. nana* and *B. exilis*] occur between Yenisei and Lena Rivers in Siberia," or more than 2,000 miles from Alaska, scarcely lends support to his contention.

Betula kenaica Evans in Bot. Gaz. **27** : 481 (1899); Hult., Fl. Al. and Yukon **4** : 576 (1944).

Steep, densely wooded east slope of Quiet Lake, Mile 55-60, a small tree 3 inches in diameter with purplish black bark, No. 11112; Rose-Lapie River pass, small tree in a ravine on southwest slope of mountain west of Mile 116, elevation 5,000 feet, No. 10059; Ross River valley, muskeg on lower east slope of Mount Sheldon, near Mile 220, Nos. 11547 and 11549; same place, near the lake shore, No. 11544; same place, rocky bluffs near Mile 218, small trees 20 feet high, Nos. 11545 and 11546.

Betula kenaica on Mount Sheldon is a small tree 20 to 30 feet high, with trunks from 2 to 5 inches in diameter, with very tight, non-exfoliating, purplish black and rough bark that, as remarked by Evans, l.c., strikingly resembles the bark of *Prunus serotina.*

The leaves are ovate, not long-acuminate, rather thick and dull, dark green above and paler beneath and thus differ markedly in shape and texture from those of all other tree-like birches in the Yukon. In Nos. 11547 and 11549 the leaves in colour, texture, and shape resemble those of *Populus tremuloides.*

The species is late flowering and several trees were noted not to fruit well. In almost mature fruiting aments, collected on August 6, the central lobe of the bract is considerably longer than the lateral ones, as correctly described by Evans, l.c., but not at all like the figure given by Butler, Bull. Torr. Bot. Cl. **36** : 431, fig. 10 (1909). The wings of the samaras are broadest above the middle, somewhat broader than the nutlet. In most trees the young twigs are smooth or, at most, with a few resinous dots. In No. 11544 some long vegetative shoots are densely resinous-dotted.

Betula occidentalis Hook., Fl. Bor.-Am. **2** : 155 (1839). *See* Fernald in Rhod. **47** : 312-17 (1945). Not *B. papyrifera*, var. *occidentalis* sensu Sargent in Journ. Arn. Arb. **1**: 63 (1919), nor *B. papyrifera* ssp. *occidentalis* Hult., Fl. Al. and Yukon **4** : 582 (1944).

B. fontinalis Sarg. in Bot. Gaz. **31**: 239 (1901).

B. Eastwoodae Sarg. in Bot. Gaz. **67** : 216 (1919).

B. glandulosa x *resinifera* Hult., Fl. Al. and Yukon **4** : 575 (1944).

Upper Rose River valley, tall bushes on burnt-over slope near Mile 95, No. 10453; Rose-Lapie River pass, 6- to 8-foot bushes in open spruce forest of lower slope of mountain west of Mile 116, No. 10058; lower Lapie River crossing, Mile 132, a shrub 8 to 10 feet high in open place near edge of *B. glandulosa* scrub, with single trees of typical *B. papyrifera* var. *neoalaskana*, No. 9437; same place, tall bushes in open spruce forest, No. 9604; same place, vigorous shoot of 6-foot bush, No. 9920; southeast slopes of Mount Sheldon, bushes or small trees 10 to 11 feet tall, below timber-line, 4,500 feet, Nos. 11716 and 11718; Macmillan Pass, Mackenzie-Yukon Divide, solitary 8-foot bush, No. 11231.

This is a very common and often primary species in southeast Yukon where it grows on gravelly river terraces, eskers, and on stable screes of the lower slopes. In such places it forms open coppices of bushes 6 to 8 feet high which branch from the base and among which one may walk with comparative ease. The presence of old charred spruce or fir logs and stumps suggests that this species invades light soils following a fire. In good soil along small streams it may attain tree-shape but rarely exceeds a height of 10 to 12 feet. The bark is reddish brown and shiny; it fruits abundantly.

This is the plant which Hultén, l.c., who has seen it only in the herbarium, considers *B. glandulosa* x *resinifera*. The fact that it is a dominant species over hundreds of square miles of interior southeast Yukon, where *B. papyrifera* var. *neoalaskana* [*B. resinifera*] is either very scarce or not found at all, certainly makes the hybrid nature of this plant open to question. Nor is its appearance in any way suggestive of the paper birch.

Betula papyrifera Marsh, Arb. Am. 19 (1775).

Rose-Lapie River pass, Mile 105, a tree 40 to 50 feet high with tight, reddish brown bark, No. 9245; same place, 40-foot tree with white, exfoliating bark, and noticeably softer wood than preceding, No. 9246; lower Lapie River crossing near Mile 132, a slender tree, 4 inches in diameter with drooping and very slender twigs and aments, No. 9538; same place, tall tree, 6 inches in diameter, in a spruce bog, No. 9540. Ross River valley, 30- to 40-foot, non-fruiting tree with white exfoliating bark growing on muskeg slope near Mount Sheldon, No. 11548.

The material in the series listed above is, with some doubt, referred to *B. papyrifera* sensu str., although, like all other material from northwest Canada and from Alaska, it lacks the pubescence on the young twigs which is generally considered characteristic for the paper birch in the east.

In southeast Yukon this is a tall tree with white, exfoliating bark and perfectly glabrous twigs. The leaves are rather firm and of a darker green than in the var. *neoalaskana* but, like it, with long-acuminate tips and cuneate bases.

This birch is rather uncommon and of very local distribution in our area. On the lower slopes of Mount Sheldon, in mixed stands of white spruce and alpine fir, it grew to 50 to 60 feet, with trunks more than 12 inches in diameter; in the Rose-Lapie Pass at 3,600-foot elevation it flowered on June 10.

Betula papyrifera var. **commutata** (Regel) Fern. in Rhod. **47** : 312 (1945).

B. occidentalis sensu Sargent. in Bot. Gaz. **31**: 237 (1901).

B. papyrifera ssp. *occidentalis* Hult., Fl. Al. and Yukon **4** : 582 (1944), not Hooker.

This well-marked variety apparently does not enter southeastern Yukon. Its nearest known station is at Liard Hot Springs on the Alaska Highway, Mile 496, Nos. 9070 and 9071, and Alaska Highway, Muncho Lake, No. 9027.

Betula papyrifera Marsh var. **neoalaskana** (Sarg.) Raup in Contr. Arn. Arb. **6** : 152 (1934).

B. papyrifera var. *humilis* sensu Fern. & Raup in Rhod. **47** : 321 (1945), not *B. alba* ssp. *papyrifera* var. *humilis* Regel in DC. Prod. **16** : 166 (1868).

B. resinifera Hult., Fl. Al. and Yukon **4** : 583 (1944).

Rose-Lapie River pass, small trees in spruce muskeg near Mile 105, No. 9247; lower Lapie River crossing, open spruce forest near Mile 132, Nos. 9539 and 9603; lower slopes of Mount Sheldon, tall white-barked trees, No. 11717.

In southeastern Yukon of similar distribution and habit as the preceding.

Fernald and Raup, l.c., p. 321, for this plant have proposed the combination of *B. papyrifera* var. *humilis* based on *B. alba*, subsp. *papyrifera*, var. γ *humilis* Regel, l.c. It seems rather doubtful, however, if Regel could actually have had this tall, tree-like birch in mind, because his description of the γ *humilis*, which Fernald & Raup only quote in part, calls for "γ humilis, trunco humili suffrutescente . . . ," which certainly does fit our plant.

Alnus crispa (Ait.) Pursh; Hult., Fl. Al. and Yukon **4** : 586 (1944).

River-banks and alluvial flats west of Nisutlin River, near Mile 36-42, Nos. 10795 and 10796; lower Lapie River crossing, on river-banks, Mile 132, No. 9269; same place, mountain slope south of crossing, No. 9605.

A common or often dominant component of alpine spruce and fir forest of steep, not too dry mountain slopes; also common in the lowland along river-banks and by alpine streams. Although the species was still common on the upper slopes of Mount Sheldon, it was seen only once north of there, near Mile 266 on the south fork of Macmillan River, and was not seen in Macmillan Pass. In lowland stations the species flowered early in June and on June 15 had young strobils.

Alnus crispa (Ait.) Pursh ssp. **sinuata** (Regel) Hult., Fl. Al. and Yukon 4 : 587 (1944).

Steep west slope of granite range east of upper Rose River, opposite Mile 95, No. 10500.

As pointed out by Hultén, l.c., the ssp. *sinuata* in Alaska and Yukon is largely restricted to the Pacific Coast with a few inland stations in the coast range of southern Yukon. It was seen nowhere else along the Canol Road.

Alnus incana (L.) Moench; Hult., Fl. Al. and Yukon 4 : 590 (1944).
A. tenuifolia Nutt.

Whitehorse, common on river-banks in wet places, No. 9164; alluvial banks west of Nisutlin River, Mile 36-42, No. 10797; lower Lapie River crossing, by a stream near Mile 132, Nos. 9268 and 9514; Ross River valley, near north end of Sheldon Lake, 3,000 feet elevation, No. 11543.

Occasional to common along the Canol Road on alluvial soils of the river valleys north to Mount Sheldon where the species was still common on the lake shore and on the lower slope of the mountain. It flowered at Whitehorse during the first week of June and on Lake Sheldon had fully mature fruits on August 6. On a small tributary to Nisutlin River, *Alnus incana* grew tree-like, 30 feet high, with trunks 8 inches in diameter, but elsewhere was bush-like, usually 20 feet high or more.

URTICACEAE

Urtica gracilis Ait.; Hult., Fl. Al. and Yukon 4 : 592 (1944).

In the Yukon collected several times in Dawson District; not seen by us.

Urtica Lyallii Wats. in Proc. Am. Acad. **10** : 281 (1875).

In the far Northwest known along the Pacific coast of Alaska but in northern British Columbia recently collected near the Yukon border at Liard Hot Springs on the Alaska Highway, Porsild, No. 9072.

SANTALACEAE

Geocaulon lividum (Richards.) Fern.; Hult., Fl. Al. and Yukon 4 : 593 (1944).

Whitehorse, common in pine woods on sandy terraces east of Lewes River, No. 9167; mossy places in spruce woods west of Nisutlin River, Mile 36-42, No. 10799; upper Rose River, Mile 95, on wooded river-flat, No. 10365; lower Lapie River crossing, in rich poplar woods near Mile 132, No. 9573; open spruce woods, No. 9270.

Occasional to common in lowland pine, spruce, or poplar woods of the southern part of the Canol Road where it appears to be restricted to the Palæozoic rocks and their sediments. The species was thus not seen north of Pelly Valley; in 1944 it flowered during the first week of June and by the third week of July had matured fruits.

Comandra pallida A. DC.; Hult., Fl. Al. and Yukon **4** : 594 (1944).

According to Hultén, l.c., this species has been collected once in Yukon River between Whitehorse and Dawson. The nearest known station to this is on Lake Athabasca.

POLYGONACEAE

Koenigia islandica L.; Hult., Fl. Al. and Yukon **4** : 595 (1944).

Upper Rose River, in springy places by a brook, Mile 95, No. 10364, northeast spur of Mount Sheldon, in wet moss by a spring, Mile 227, No. 11466.

The species apparently is very rare, and although many suitable places were seen, it was observed nowhere else. The Rose River specimens are young and were in beginning anthesis on July 14; the Mount Sheldon plants are 15 cm. tall and had mature fruits on August 12.

In the Yukon, *Koenigia* has been collected previously only once, on Lake Bennett.

Rumex Acetosella L., Sp. Pl. 338 (1753).

Introduced at Dawson, J. Macoun, No. 91291.

Apparently uncommon and was not seen by us.

Rumex arcticus Trautv.; Hult., Fl. Al. and Yukon **4** : 600 (1944).

Northeast spur of Mount Sheldon, in subalpine meadow, elevation 3,400 feet, near Mile 226, No. 11468. Also from McQuesten River, Christie, No. 33, and Mayo District, Anderson, No. 9679.

A common and often dominant species in deep, rich soil in subalpine meadows of the upper Ross and Macmillan Rivers north to Macmillan Pass where it was usually associated with *Delphinium glaucum*, *Thalictrum sparsiflorum* var. *Richardsonii*, *Geum macrophyllum* ssp. *perincisum*, *Polemonium acutiflorum*, and grew to a height of 100 cm. or more from a thick, fleshy rootstock. The blade of the basal leaves is elliptical, often measuring 10 x 5 cm. The tender, succulent young leaves may be eaten raw as salad. Our specimens probably are var. *perlatus* Hult., Fl. Al. and Yukon, 600 (1944) and on August 4 had almost mature fruits.

Rumex crispus L.; Hult., Fl. Al. and Yukon **4** : 601 (1944).

In Yukon collected twice in Dawson district.

Rumex maritimus L.; Hult., Fl. Al. and Yukon **4** : 604 (1944).

Pelly Valley, rolling lake-filled plain south of Pelly River, Mile 136-138, in an alkaline meadow, Nos. 11170 and 11916.

Our specimens are a good match for specimens in the National Herbarium of Canada from Dawson, which are referred to this species by Hultén, l.c. Number 11170 flowered on July 7, whereas No. 11916 had almost mature fruits on August 1. There can be little doubt that the species is indigenous, at least on Pelly River.

Rumex occidentalis Wats.; Hult., Fl. Al. and Yukon **4** : 605 (1944).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 610, 724, and 747. In wet places in a river meadow west of Nisutlin River near Mile 36, No. 10798. Tall specimens with almost mature fruits on July 24. Also Dawson, Malte, No. 284.

The species apparently is rare along the Canol Road and was seen nowhere else.

Rumex pallidus Big., Fl. Bost. ed. **3** : 153 (1840).

R. sibiricus Hult., Fl. Al. and Yukon **4** : 605 (1944), in part.

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 744; also from Dawson District, Klondike River, Macoun, Can, No. 91293, and Dawson, Malte, August 12, 1916.

Both collections represent young, flowering specimens but are a close match for large series of flowering and fruiting plants from lower Mackenzie River and, like these, are procumbent. The plant is a lakeshore and riverbank species and is not by any means restricted to salt marshes.

Rumex utahensis Rech. fil. in Field Mus. Nat. Hist., Bot. Ser. **17** : 76 (1937) fig. 15.

Ross River valley, gravelly east shore of Sheldon Lake, elevation 3,000 feet, No. 11551. Also from Haines Road junction, Alaska Highway, Mile 1016, M. P. and R. T. Porsild No. 245.

Our plant closely matches the description and figure of *R. utahensis*, as well as of the single specimen in the National Herbarium cited by Rechinger, l.c., from Calgary, Alta., Macoun, No. 24679. Our No. 11551 has procumbent-ascending, somewhat flexuous and coarse stems, about 60 to 75 cm. long with glabrous, lanceolate, and somewhat fleshy leaves with undulate, slightly crisped margins. The inflorescence is large and the divergent branches spike-like, due to the contiguous glomerules. The valves are strongly suffused with purple and are all grainless; the fully mature achenes are about 2 mm. long, smooth, and pale brown.

For *R. utahensis*, Rechinger gives the following distribution: "Rocky Mts. between 36° and 43° N. Lat.," thus overlooking the single Canadian station from Calgary (latitude 51°) cited by himself, l.c.

Oxyria digyna (L.) Hill; Hult., Fl. Al. and Yukon **4** : 607 (1944).

Alpine slopes of mountain east of Mile 85 on upper Rose River, elevation 5,000 feet, No. 10167; lower Lapie River crossing, alpine slopes of mountain west of Mile 132, No. 9708; gravel bars of south fork of Macmillan River, Mile 280, No. 11298.

A common species along the Canol Road above timber-line, in moist heath and by alpine streams and on snowflushes. In the valleys the species was rarely missing on the erosion fans of alpine streams and on river bars where snow or ice remain late. On Mount Sheldon and on other mountains it was noted at least to 6,000 feet. The succulent and tender young leaves are edible and may be eaten raw or cooked, like rhubarb.

Polygonum achoreum Blake in Rhod. **19** : 232 (1917).

Whitehorse, Anderson, No. 9638; Mayo, idem, No. 9747, introduced in both places.

Polygonum alaskanum (Small) Wight in Hult., Fl. Al. and Yukon, **4** : 610 (1944).

P. alpinum All. var. *lapathifolium* Cham. & Schlecht.

South and east slopes of Mount Sheldon, in steep ravines opposite Mile 222, elevation 3,500 feet, No. 11719; upper south fork of Macmillan River, on gravel outwash plain, opposite Mile 280, No. 11299.

Occasional to common on Mount Sheldon and on Macmillan River north to Macmillan Pass where the species grows in moist ravines and on gravel bars in river-flats.

From central Yukon, Hultén, l.c, p. 612, has described a var. *glabrescens* which differs from the typical plant of Alaska by its merely ciliate leaves and glabrous inflorescence. In our specimens the branches of the inflorescence are pilose, and the leaves glabrous, except along the margins. Thus they are intermediate between var. *glabrescens* and the typical plant of Alaska-Yukon.

A still more marked variety is found in Mackenzie Delta (Porsild in Sargentia 4 : 29 (1943)), which is totally glabrous except for the slightly pilose ochreae; its leaves are large, strongly crisped, and non-ciliate, and the plant is often 5 to 6 feet tall. The tender, young sprouts of *Polygonum alaskanum* make a most satisfactory substitute for rhubarb.

Polygonum amphibium L. ssp. **laevimarginatum** Hult., Fl. Al. and Yukon, p. 612 (1944).

P. amphibium var. *natans* Michx.

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 539 and 618; northeast spur of Mount Sheldon, on the clay margin of a summer dry pond in subalpine meadow, near Mile 226, No. 11467; also from Snag, White River, July 2, 1944, G. A. Noel.

Our Sheldon specimens had been floating earlier in the season but were terrestrial when collected and on August 4 were still completely sterile, whereas specimens from Johnson Crossing flowered on July 14.

Apparently a rare plant which has been collected only a few times in Yukon and Alaska.

Polygonum Bistorta L. ssp. **plumosum** (Small) Hult., Fl. Al. and Yukon 4 : 613 (1944).

P. Bistorta Am. auctt.

Lower Lapie River, moist alpine summit of mountain west of Mile 132, elevation 6,000 feet, No. 9461; mossy alpine tundra near summit of mountain south of road, 6,000 feet elevation, Nos. 9606 and 9921.

This plant, which apparently is very rare in southeast Yukon, was seen only on high mountains of the northern edge of Pelly Plateau where it was quite abundant locally on two separate mountains. Here, on June 26, at 6,000 feet elevation, several acres of moist, alpine tundra were coloured bright pink by its showy spikes. In Yukon, otherwise known from unglaciated parts of central and northern Yukon.

Polygonum buxiforme Small.; Hult., Fl. Al. and Yukon 4 : 615 (1944).

An introduced species, which in Yukon has previously been collected at Dawson. Also at Mayo, Anderson, No. 9746B.

Polygonum caurianum Robins. in Proc. Bost. Soc. Nat. Hist. **31** : 218, (1885); Hult. Fl. Al. and Yukon **4** : 616 (1944), as *P. caurinum.*

Ross River valley, sandy shore of Lake Sheldon, elevation 3,000 feet, No. 11550.

Apparently rare in the Yukon where it has been collected only once, at Dawson (Eastwood 287, G). On Sheldon Lake our specimens on August 15 had fully expanded flowers and a few, almost mature fruits, but in a less favourable year they probably would not have produced mature fruits. The small colony grew on a muddy flat frequented by ducks and shore birds, to which the species may owe its apparently precarious establishment on Lake Sheldon. Dr. J. F. Brenckle kindly verified the determination of the specimens.

Polygonum Convolvulus L., Sp. Pl. 364 (1753).

Introduced at Dawson where it was collected by Malte, August 12, 1916.

Polygonum heterophyllum Lindm. in Sv. Bot. Tidskr. **6** : 690 (1912).

Johnson Crossing, roadsides and lake shore where it appeared to be a recent introduction, M. P. and R. T. Porsild, Nos. 557, 597, and 715.

Polygonum Persicaria L., Sp. Pl. 361 (1753).

Canol Road, Mile 55-60, near Quiet Lake, No. 11124.

The species grew near a road camp with other introduced species and, on July 4, had not yet flowered.

Polygonum prolificum (Small) Robins.; Hult., Fl. Al. and Yukon **4** : 619 (1944).

A weed which has been recorded once in Yukon, from Whitehorse.

Polygonum viviparum L.; Hult., Fl. Al. and Yukon **4** : 620 (1944).

Rose-Lapie River pass, sandy river-bank east of Lapie Lake, Mile 105, No. 9343; lower Lapie River crossing, Mile 132, No. 9515; same place, in rich poplar woods, No. 9583; same place, gravelly river bars, No. 9680; Pelly River valley, turfy lake shore, Mile 136, No. 9658.

Occasional to common along the Canol Road and noted from all stations from the lowland to high altitudes. On Mount Sheldon it grew on rocky ledges at the very summit, at 7,200 feet elevation.

CHENOPODIACEAE

Chenopodium album L., Sp. Pl. 219 (1753).

Canol Road, Mile 55-60, near Quiet Lake, No. 11125; young plants with other introduced species near an abandoned road camp; young plants also seen on Pelly River near Ross trading-post, No. 9688. Also a roadside weed at north fork of Klondike River, Cockfield, No. 13, and at Dawson, Malte, No. 283.

Chenopodium capitatum (L.) Aschers.; Hult., Fl. Al. and Yukon **4** : 625 (1944).

Whitehorse, common by roadsides and flowering on June 7, No. 9165; Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 474; lower Lapie River crossing, Mile 132, common by a "bulldozer" trail in muskeg, No. 9826. Also noted near abandoned trapper's cabin on Nisutlin River, Mile 39, and near road camp near Mount Sheldon, as well as in a few other places, all near human habitations or by roadsides.

Hultén, l.c., states that the species is "undoubtedly indigenous" in the interior of Alaska and Yukon. The writer doubts that this is the case, for although *C. capitatum* has been collected in a great many places, it always occurs in close proximity to human habitations. Along the Canol Road it unquestionably owed its presence and astonishingly rapid spread to human agencies (Compare pp. 34-5). On Lapie River its tiny seeds were fully mature on June 22.

Chenopodium gigantospermum Aellen; Hult., Fl. Al. and Yukon 4 : 626 (1944).
In Yukon thus far collected only at Dawson where it is, undoubtedly, introduced. Macoun (Can, No. 91390, as *C. hybridum*) and Malte, No. 286.

Chenopodium leptophyllum Nutt.; Hult., Fl. Al. and Yukon 4 : 627 (1944).
In the Yukon introduced at Carcross and in the Dawson district.

Chenopodium rubrum L., Sp. Pl. 218 (1753).

Pelly River valley, rolling lake-filled plain south of Pelly River, Mile 136-138, in wet places in an alkaline meadow with *Rumex maritimus*, No. 11917.

A notable extension of the known range of this species, the nearest station of which is in upper Mackenzie Basin on salt plains west of upper Slave River (Raup). Our specimens grew far from human habitation and appeared to be indigenous.

Monolepis Nuttalliana (Schultes) Greene; Hult., Fl. Al. and Yukon 4 : 628 (1944).

Whitehorse, steep cut-bank east of Lewes River, No. 9166; Alaska Highway, Haines Junction, No. 11953; also from Carcross, Anderson and Brown, No. 10348, and previously known from Dawson District.

Common also along the Alaska Highway between Teslin Lake and Whitehorse. Our specimens flowered on June 7.

Salicornia herbacea L., Sp. Pl. ed. **2** : 5 (1762).

Alaska Highway, Mile 945, Anderson and Brown, No. 10339.

New to the flora of Yukon.

Suaeda maritima (L.) Dum., Fl. Belg. 22 (1827).

Carcross, Anderson and Brown, No. 10349; Alaska Highway, Mile 945, Anderson and Brown, No. 10340.

New to the flora of Yukon.

PORTULACACEAE

Claytonia Bostockii Porsild, n.sp. (Plate XVII, figures 3 and 4)

Perennis rhizomate ramoso tenui stolones foliosos gracilesque gerente. Caules florigeri solitarii graciles erecti, 8-10 cm alti, foliis binis vel ternis alternantibus linearibus sessilibus, 1-2 cm longis, radicalibus subcarnosis. Stolonum folia lineari-oblanceolata petiolata, 2-3 cm longa 0·2 cm lata. Inflorescentia laxe cymosa, floribus binis vel ternis, bractea unica lanceolata 6 mm longa subtensis. Pedicelli initio reflexi, per anthesim erecti, 1·5 cm longi. Calycis lobi 0·5-0·6 cm longi, pallide rosei; petala centimetralia subemarginata, pallide rosea nervis conspicuis. Fructus non visus.

Dawson Range, near headwaters of Klaza River, approximate latitude 62° 20′ N. and longitude 137° 30′ W., in wet springy places on north-facing slope, elevation 4,200 feet, July 12, 1933, Bostock, No. 19 (type).

The type collection consists of 8 well-preserved specimens in full flower. The species is named for Dr. Hugh S. Bostock of the Geological Survey of Canada, who in the course of many seasons spent in the Yukon has added so much to our knowledge of the alpine flora of central Yukon.

A second collection, probably of this species, is in the National Herbarium, collected at Mile 349 on the Hudson Bay Railroad, Manitoba, July 8, 1936, by P. A. Taverner. Although a mere fragment, it closely resembles the Yukon plant.

Claytonia Bostockii undoubtedly is the plant referred to by Hultén, l.c., p. 643, from the head of Ketchumstock Creek, Alaska, July 41, 1921, Murie No. 190, which he considers closely related to *C. Vassilievii* Kuzen., Fl. U.S.S.R. **6** : 880 (1936), from Anadyr, E. Siberia.

Claytonia sarmentosa C. A. Mey. in Mém. Soc. Nat. Mosc. **7** : 137 (1829).

Pass between Teslin and Nisutlin Rivers, Mile 10-14, M. P. and R. T. Porsild, No. 670; granite range west of upper Rose River opposite Mile 95, elevation 5,000 feet, No. 11927. Also Haines Road, Mile 85, C. H. D. Clarke, No. 531.

On Rose River this very pretty species grew in wet mossy places with *Ranunculus Eschscholtzii*, *Saxifraga Lyallii*, and *Corydalis pauciflora* by an alpine stream above timber-line between 4,200 and 5,600 feet.

The fully expanded flowers are 2·0 cm. in diameter; the petals in life, rose or pale pink or even white, emarginate with a yellow claw. This species flowered from the first week of July and on July 16 was still in full bloom.

Claytonia sarmentosa is common on islands and shores of Bering Sea and Strait and on high mountain of central Alaska but apparently has not heretofore been collected in the Yukon or elsewhere in Canada.[1]

Claytonia Scammaniana Hult. in Bot. Not. 1939, p. 826, fig. 1.

Mayo District, McArthur Mountains, latitude 63° 10′ N. and longitude 135° 55′ W., on a slate slide 6,000 feet elevation, June 26, 1940, Bostock, No. 163; Black Ram Hot Springs, July 16, 1941, Bostock, No. 206.

Dr. Bostock's very fine flowering specimens extend the known range of this beautiful *Claytonia* to the Yukon. Heretofore it was known only from mountains of unglaciated central and southwestern Alaska.

Claytonia tuberosa Pall. ex Willd. in Roem. & Schult. Syst. Veg. **5** : 436 (1819).

Mayo District, McArthur Mountains, latitude 63° 40′ N. and longitude 134° 20′ W., flowering specimens on July 5, 1939, Bostock, No. 47.

New to the flora of Yukon.

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[1] Hultén, l.c., p. 640, may be correct that Krause's "Upper Krotahina R.," is in British Columbia rather than in Alaska, but as that name is not shown on any Canadian map, the exact location cannot be verified.

CARYOPHYLLACEAE

Stellaria calycantha (Ledeb.) Bong. in Mém. Acad. Imp. Sc., St. Petersb., Ser. 6, Math. **2** : 127 (1833).

Whitehorse, Miles Canyon, M. P. and R. T. Porsild, No. 64; east shore of Quiet Lake, densely wooded slope near Mile 55-60, No. 11113; lower Lapie River crossing, Mile 132, in wet places by roadside, No. 9541; same place, in rich poplar woods, No. 9574; south fork of Macmillan River, northwest end of Itsi Range, Mile 260, No. 11387.

Stellaria calycantha var. **isophylla** (Fern.) Fern. in Rhod. **42** : 255 (1940) tab. 602, fig. 2, and tab. 603, fig. 4.

S. calycantha ssp. *interior* Hult., Fl. Al. and Yukon, **4** : 648 (1944).

Johnson Crossing, Mile 0, in roadside ditches, M. P. and R. T. Porsild, No. 423; east slope of Rose River valley near Mile 77, in wet places by a creek, No. 10281; upper Rose River, Mile 95, Nos. 10366 and 10437; south fork of Macmillan River, Mile 240-250, No. 11423; upper south fork of Macmillan River, in gravel bars opposite Mile 280, No. 11304.

Stellaria calycantha s. lat. is common along the Canol Road and probably elsewhere in the Yukon on lake shores and in wet river meadows. By following Hultén's key it is possible to sort the Yukon material into two more or less distinct series. One, with moderately branched, glabrous stems and 3 to 4 long sepals, is *S. calycantha* s. str.; the other, a smaller plant with much branched, scabrous stems and 2 mm. long sepals, is the var. *isophylla* [ssp. *interior* Hult.]. Hultén, who had not seen Fernald's recent treatment, considered the latter a geographical race confined to the interior of Alaska and Yukon. In the field the difference between the two plants is less distinct and both may be found growing together, although var. *isophylla* is generally confined to open and more alpine stations, whereas *S. calycantha* s. str. is most often found in moist and shady lowland stations but is not, as Hultén suggests, absent in the interior.

Stellaria ciliatosepala Trautv.; Hult., Fl. Al. and Yukon **4** : 649 (1944).

East slope of Rose River valley, Mile 77, in a pine bog, No. 10280; grassy summit and upper slopes of mountain south of Lapie River crossing, Mile 132, elevation 5,600 feet No. 9925. In Yukon also known from the Dawson District.

The first-cited specimen is doubtfully placed here, because it lacks the scarious upper bracts of the inflorescence.

Stellaria crassifolia Ehrh.; Hult., Fl. Al. and Yukon **4** : 651 (1944).

Shelving river-banks west of Nisutlin River, Mile 36-42, No. 10801; Pelly River valley south of Pelly River, Mile 136, in wet moss by a lake, Nos. 9887 and 11171; northeast spur of Mount Sheldon, among *Carices* in wet meadow near Mile 226, No. 11986; upper south fork of Macmillan River on gravel outwash plain near Mile 280, No. 11303. In the Yukon previously known from the Dawson District and from the Arctic Coast.

Common in wet meadows, river-banks, and lake shores in all places where collections were made. Near Macmillan Pass the species apparently does not normally flower and fruit (No. 11303) but is propagated by winter buds formed at the end of the sterile shoots (*See* also Porsild in Sargentia **4** : 37 (1943)). On Pelly River the species flowered on June 25.

Stellaria crispa Cham. & Schlecht. in Linnaea **1**: 51 (1826).

Alaska Highway, White River, Anderson, No. 9323. New to the flora of Yukon.

Stellaria humifusa Rottb.; Hult., Fl. Al. and Yukon **4** : 653 (1944).

Common along the arctic sea-coast.

Stellaria longifolia Muhl.; Hult., Fl. Al. and Yukon **4** : 655 (1944).

Alluvial flats on Sydney Creek west of Nisutlin River, Mile 30, in a meadow where horses had been grazed and where a number of introduced species were found, No. 10800; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11470; in meadows on the south fork of Macmillan River, Mile 250, No. 11422.

Along the Canol Road the species was found only in certain kinds of subalpine meadows associating with other species of a relic prairie flora. On Macmillan River a few capsules were maturing on August 21, but most of the later flowers were damaged by frost.

Stellaria longipes Goldie var. *See* Hult. in Bot. Notiser, 1943, pp. 251-270.

Pass between Teslin and Nisutlin Rivers on alpine slopes east of Mile 14, elevation 4,500 feet, No. 10992; Rose-Lapie River pass, summit of mountain east of Mile 105, elevation 6,000 feet, No. 9391; shale mountain west of Mile 132, dry, shaly slopes, 5,000 feet, No. 9463; south shoulder of Mount Sheldon, elevation 5,600 feet, No. 11612; upper south fork of Macmillan River, in gravel outwash plain near Mile 280, No. 11302.

The *Stellaria longipes* complex in Alaska-Yukon, as well as in other arctic and boreal parts of North America, is urgently in need of a thorough revision. As the group is so variable and very considerably affected by edaphic factors, such revision should follow the study of carefully selected ecotypes in cultivation. Hultén's key is workable only when applied to the select few specimens cited by him but proves inadequate when used in the field or if applied to the large series present in many North American herbaria, the difficulty being that the characters used for separation are unstable and variable. The pubescence on the stem and sepals is variable (compare also Raup in Sargentia **6** : 169 (1947)), especially so in western material, although specimens with pubescent or ciliate sepals are found in the National Herbarium at Ottawa from Greenland and Hudson Bay as well. Lustrous, dull green, or glaucous leaves too are variable characters, and leaves that in nature were glaucous and dull, in the herbarium often appear lustrous if artificial heat was used in drying.

The specimens cited above are rather uniform and belong to the arctic-alpine race common in southeast Yukon. This race is perfectly glabrous, with glaucous and more or less shiny leaves, single-flowered with scarious margined, non-ciliate sepals. It is no doubt close to *S. Edwardsii* Richards.; from which it differs by lack of pubescence on the stem and leaf-margins. Hultén, l.c., has taken up *S. laeta* Richards. which he distinguishes by its lack of scarious margined bracts, lustrous leaves and "sepals ciliated in the margin, more or less pilose on the back," although the original description merely calls for "calyce glabro pubescenteve obscuro trinervi." Still another segregate, *S. monantha* Hult., like *S. laeta*, lacks the scarious bracts in the inflorescence but is said to have pubescent sepals.

Stellaria longipes s. str., the type of which came from Lake Ontario, although apparently present in central Alaska and Yukon, was not seen by us along the Canol Road.

Stellaria media (L.) Cyr.; Hult., Fl. Al. and Yukon **4** : 657 (1944).

Quiet Lake, Mile 55, by the roadside near abandoned camp, where it was introduced recently with other weeds, No. 11126. Common throughout Yukon Territory in inhabited places.

Stellaria sitchana Steud.; Hult., Fl. Al. and Yukon **4** : 659 (1944).

Recorded by Hultén from Five-Finger Rapids on the upper Yukon. I have seen no specimens from Yukon.

Stellaria sp.

Whitehorse, occasional in open, sandy places east of Lewes River, No. 9170; lower Lapie River crossing, in sandy and gravelly places by river, Mile 132, No. 9516; same place, in rich poplar woods, No. 9832.

A rather peculiar plant with narrow, strongly keeled, fresh green and somewhat shiny leaves, very pubescent lower internodes, pubescent peduncles, and scarious margined, strongly pubescent sepals. Our plant appears to be restricted to calcareous, sandy places along rivers and was not seen north of Lapie River. It is, no doubt, what Hultén, l.c., calls *S. Laxmanni* Fisch., of which the writer has seen no authentic material and of which the description, DC. Prod. **1** : 397 (1824), is so general as to be of no help. Ledebour, Fl. Ross., tab. 423, shows a plant with perfectly glabrous stems and sepals, whereas *S. Laxmanni* in Alaska is said to have "sepals densely pubescent on the back, especially towards the tip" (Hultén, l.c.).

Cerastium arvense L.; Hult., Fl. Al. and Yukon **4** : 663 (1944).

Alaska Highway, Haines Junction, M. P. and R. T. Porsild, No. 131; Whitehorse, in sandy soil near the boat-landing, Nos. 9168 and 9169; same place, common on dry bluffs and slopes east of Lewes River, No. 10666. Noted at Ross Post on Pelly River, Mile 141.

Typical *Cerastium arvense* was observed also along the highway between Whitehorse and Johnson Crossing but was not seen along the Canol Road proper. At Whitehorse it flowered on June 7, and on July 28 the capsules had been open for some time.

Cerastium Beeringianum Cham. & Schlecht. in Linnaea **1**: 62 (1826).

C. arcticum Hult., Fl. Al. and Yukon **4** : 662 (1944), quoad pl. ex Yukon.

Whitehorse, Miles Canyon, M. P. and R. T. Porsild, No. 65; pass between Teslin and Nisutlin River, idem, No. 672; east slope of Rose River valley near Mile 77, in open pine bogs, No. 10279; same place on alpine slopes above timber-line, elevation 5,000 feet, No. 10949; east slope of upper Rose River valley, Mile 95, in an old burn, No. 10454; Rose-Lapie River pass, in alpine meadow near Mile 105, No. 9798; lower Lapie River crossing, grassy summit of mountain south of Mile 132, Nos. 9596 and 9924; same place, dry river terraces, No. 9682; same place, in rich poplar woods, No. 9833; northeast shoulder of Mount Sheldon, on alpine slope in glacial cirque, 5,000-foot elevation, No. 11075; upper south fork of Macmillan River, in gravel outwash plain opposite Mile 280, No. 11301; Macmillan Pass, Mackenzie-Yukon Divide, on gravel bars in river, Mile 284, No. 11230. Also Mayo District, Bostock, No. 207, and Kluane Lake, Anderson, No. 9419.

A common species especially in the northern part of our area where it is commonly found on gravel bars, outwash plains, and in freshly exposed soil on slides, to elevations of 6,000 feet. It flowers very early and on Lapie River on June 20 had mature fruits. The specimens in the above series show remarkably little variation.

Cerastium caespitosum Gilib.; Hult., Fl. Al. and Yukon **4** : 667 (1944).

C. vulgatum L.

An introduced species recorded once, from Dawson.

Cerastium glomeratum Thuill.; Hult., Fl. Al. and Yukon **4** : 668 (1944).

C. viscosum L.

An introduced species recorded repeatedly from the Dawson district.

Cerastium maximum L.; Hult., Fl. Al. and Yukon **4** : 668 (1944).

Occasional to common in lowland willow thickets in unglaciated central Yukon north to the Arctic Coast but in the interior so far not found east of Yukon Valley. In addition to the stations given by Hultén, l.c., collected in the Dawson Range, 62°40′ N., 138° W., Bostock, No. 246.

Sagina intermedia Fenzl; Porsild, Sargentia **4** : 31 (1943).

Upper Rose River valley, on gravelly river-flat near Mile 95, No. 10368.

Although searched for diligently, here and elsewhere, only a single specimen was found. On July 14 nearly all capsules of the year were fully open. The single previous record from the Yukon is from Shingle Point on the Arctic Coast west of Mackenzie Delta.

Sagina Linnaei Presl, Rel. Haenk. **2** : 14 (1831).

Upper Rose River valley, on gravel outwash fan near Mile 95, No. 10439; Rose-Lapie River pass, on moist, grassy slope near headwaters of Rose River, Mile 98, elevation 4,000 feet, No. 11900; same place, gravelly slope near snowbank at summit of mountain east of Mile 105, elevation 6,000 feet, No. 10892; southeast slope of Mount Sheldon, in a ravine at 6,000-foot elevation, No. 11742; same place, 5,000 feet, No. 11769; upper south fork of Macmillan River, on a gravel outwash plain near Mile 280, No. 11300.

An alpine species which is probably fairly common on moist places on mountains of the region, ascending at least to 6,000 feet. Specimens on Rose River had almost mature fruits on July 12.

New to the flora of the Yukon.

Arenaria arctica Stev.; Porsild, Sarg. **4** : 30 (1943).

Alsine arctica Macoun & Holm, Rept., Can. Arct. Exp. **5** : 12A (1921).

Minuartia arctica Hult., Fl. Al. and Yukon **4** : 678 (1944).

McQuesten Range, Christie, No. 35; Mayo, Bostock, No. 53; Kluane Lake, Clarke, No. 232. Also recorded from Black River and the Arctic Coast.

An alpine-arctic species which in the Yukon has been collected only a few times. On the Canol Road we did not see it until east of the Mackenzie-Yukon Divide where it was common on limestone.

Arenaria dawsonensis Britt. in Bull. N.Y. Bot. Gard. **2** : 169 (1901).

Minuartia stricta Hult., Fl. Al. and Yukon 686 (1944), pro max. pte., not *M. stricta* (Sw.) Hiern, nor *Arenaria stricta* Michx., Fl. Bor.-Am. **1** : 274 (1803).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 327, 491, and 598; Whitehorse, in a wet hollow, No. 9171; upper Rose River, gravelly river-flat near Mile 95, No. 10367; lower Lapie River, on gravelly river-flat, Mile 127, No. 10015; lower Lapie River crossing, Mile 132, in rich poplar woods, No. 9831; Pelly River valley, wet gravelly lake shore, Mile 136, No. 9849; also Haines Road near boundary, M. P. and R. T. Porsild, No. 176.

Hultén, l.c., states that he can see no essential difference between the American plant *A. dawsonensis*, which has "always been regarded as a distinct species" and the Scandinavian *Minuartia* [*Arenaria*] *stricta*. Although, admittedly, in the herbarium the two species may appear very similar, they are easily distinguished in the field and, furthermore, are both found in North America. *A. dawsonenis* has a weak tap-root and never develops tussocks; its stems are tall and much branched above, many flowered, often more or less spreading or even decumbent; the seeds are oblong, never globular, and the testa prominently granulate. *A. uliginosa* [*Minuartia stricta*], on the other hand, as well illustrated in Fl. Dan. Tab. 2962, has a well-developed tap-root and forms loose, soft tussocks; its stems are usually simple, low, 1- to 3-flowered, and erect; and the seeds globular, smaller, and less prominently granulate. It is an arctic-alpine species which usually grows in wet tundra, whereas *A. dawsonensis* is boreal rather than arctic and inhabits moist lake shores and river-flats, extending northward only to the limit of trees.

In Yukon *Arenaria dawsonensis* is a lowland species found only in river valleys where it flowers and fruits later than *A. uliginosa*.

Arenaria humifusa Wahlenb.; Hult., Fl. Al. and Yukon **4** : 689 (1944).

Haines Road near boundary, M. P. and R. T. Porsild, No. 246a; Pelly River valley, in peaty soil on the side of a hummock by a lake near Mile 136, No. 9659. In the Yukon previously recorded from the Dawson district.

Although a widely ranging species in North America, the distribution of *Arenaria humifusa* is by no means continuous, perhaps due to its specialized edaphic requirements, and there is little doubt that this tiny species is among the rarest of widely ranging arctic plants.

Arenaria laricifolia L. *See* Fern., Rhod. **21**: 16 (1919).

Minuartia laricifolia Hult., Fl. Al. and Yukon **4** : 681 (1944).

In Yukon-Alaska of similar distribution as *A. nardifolia* and, like it, extending north to mountains west of the Mackenzie Delta. Not seen along the Canol Road.

Arenaria lateriflora L., Sp. Pl. **1**: 423 (1753).

Moehringia lateriflora Hult., Fl. Al. and Yukon **4** : 689 (1944).

Steep west slope of granite range east of upper Rose River, Mile 95, No. 10501; Rose-Lapie River pass, on grassy slopes near headwaters of Rose River, Mile 102, No. 10612; lower Lapie River crossing, in shaded ravine of lower slopes of mountain west of Mile 132, No. 9465; northeast spur of Mount Sheldon, very rare in subalpine meadows near Mile 226, No. 11469; south shoulder of Mount Sheldon, in subalpine meadow, elevation 4,300 feet, No. 11674. Also noted in alpine meadows at Mile 14 and on Macmillan River, Mile 250. Apparently common in Yukon Valley and collected once in Dawson Range, Bostock, No. 21.

Along the Canol Road, *A. lateriflora* was rare and always restricted to the subalpine meadows that are considered relics from former more extensive grasslands. It probably does not fruit here except in favourable years. In the Rose-Lapie River pass the first flowers were seen on July 18, and on Mount Sheldon it still flowered on August 10.

Arenaria macrocarpa Pursh, Fl. Am. Sept. **1**: 318 (1814); Porsild, Sargentia **4** : 30 (1943).

Minuartia macrocarpa Hult., Fl. and Al. and Yukon **4** : 682 (1944).

In Yukon, *A. macrocarpa* so far has been recorded only from the Arctic Coast but along the Canol Road was found on limestone rocks east of the Mackenzie-Yukon Divide; it probably extends into Yukon in the Ogilvie Mountains.

Arenaria nardifolia Ledeb. in Fl. Altaica **2** : 166 (1830); Ic. Fl. Ross. **1**, tab. 6 (1829); Hook., Fl. Bor.-Am. **1**: 98, tab. 32 (1830).

A. capillaris Hult., Fl. Al. and Yukon **4** : 687 (1944). Compare also Maguire in Bull. Torr. Bot. Cl. **74** : 41 (1947).

Whitehorse, shaly bluffs and dry hillsides east of Lewes River, with mature fruits, July 28, No. 10664. In Yukon previously collected at Whitehorse, in the Dawson District, and at Lake Aishishik, W. J. Tyrrell, Can, Nos. 19434 and 19435 (the last two numbers erroneously labelled "northern B.C.").

Hultén, Fl. Kamtch. **2** : 85 (1928), stated that the American plant, which has generally passed under the name of *A. capillaris* or *A. nardifolia*, is not the real *A. capillaris* Poir., but in his Fl. Al. and Yukon, he nevertheless has taken up *A. capillaris* Poir. for the Alaska-Yukon plant, adding that the latter "differs from *A. nardifolia* Ledeb., which is only a form of *A. formosa* Fisch., in the subulate apex of the leaves of the sterile shoots." Actually our plant is a perfect match for the plant which Ledebour, l.c., described and illustrated but in Fl. Ross. **1** : 366 (1842) reduced to *A. formosa α glabra*. Furthermore, the leaf-apices of the sterile shoots in *A. formosa* of the Rocky Mountains are as subulate as are those of the Alaska-Yukon plant. Lacking authentic Asiatic material for comparison it seems best, therefore, for the present, to retain our plant under *A. nardifolia*. In the latter plant the stems and peduncles are perfectly glabrous, whereas in all American material of *A. formosa* the stems and peduncles are glandular-puberulent. The seeds of our plant are almost coal-black, dull, finely granulate, angular-oblong, 0·8 x 0·6 mm.

Arenaria nardifolia, from central Alaska and upper Yukon Valley, extends north to the Arctic Coast, east of the Mackenzie, and south and east to Great Bear Lake. It grows on dry, sandy slopes and on river-banks.

Arenaria obtusiloba (Rydb.) Fern. in Rhod. **21**: 14 (1919).

Minuartia obtusiloba Hult., Fl. Al. and Yukon **4** : 684 (1944).

North fork of Klondike River, Cockfield, No. 16; Dawson, Malte, Nos. 102 and 103.

A Cordilleran species that extends north to mountains of central and northern Alaska and to the Arctic Coast near the Mackenzie Delta.

Arenaria peploides L., Sp. Pl. **1**: 423 (1753).

Halianthus peploides Macoun & Holm, Rept. Can. Arct. Exp. **5**: 11A (1921).

Honckenya peploides Hult., Fl. Al. and Yukon **4** : 674 (1944).

In Yukon known only from the Arctic Coast.

Arenaria physodes Fisch. in DC., Prodr. **1** : 413 (1824).

Merckia physodes Hult., Fl. Al. and Yukon **4** : 691 (1944).

This species apparently is quite common along Yukon River and has been collected at least a dozen times in the Dawson District. In the National Herbarium, Ottawa, there is a specimen from southeast Yukon, from "Pelly Banks" on upper Pelly River, collected by Dawson, July 31, 1887, besides three collections from the Mayo district: Big Kalzas Lake, Hugh Bostock, No. 165, and Stewart River, 63° 30′ N. and 134° W., idem, No. 48, and Anderson, No. 9680.

It is strange that we did not encounter this species anywhere along the Canol Road.

Arenaria Rossii R. Br. in Parry's 1st. Voy., App. 272 (1824).

Rose-Lapie River pass, on glacial drumlins near headwaters of Rose River, No. 10615; on rocky ledges near summit of mountain east of Mile 105, elevation 6,000 feet, No. 10891; alpine slope of mountain south of Mile 132 on lower Lapie River, elevation 5,600 feet, No. 9609; same place, on rocky ledges at summit, No. 9922.

In the Arctic and in high-alpine situations *A. Rossii* forms small, compact tufts but at lower altitudes assumes a more loosely tufted growth form (*Minuartia elegans* sensu Hultén, l.c.).

On Lapie River, *A. Rossii* flowered on June 15 and had mature fruits on July 19. It is new to the flora of Yukon.

Arenaria sajanensis Willd. ex Schlecht. in Berl. Gesellsch. Nat. Fr. Mag. **7** : 200 (1816).

Minuartia biflora Hult., Fl. Al. and Yukon **4** : 680 (1944).

Haines Road, boundary, M. P. and R. T. Porsild, No. 177; alpine slope above timber-line east of Mile 77 on upper Rose River, No. 10950; steep west slope of granite range east of upper Rose River, Mile 95, elevation 6,000 feet, Nos. 10502 and 10503; same place, alpine slopes west of Mile 95, No. 10564; Rose-Lapie River pass, summit of mountain east of Mile 105, No. 9392; alpine slope of granite mountain west of Mile 116, No. 10060; south shoulder of Mount Sheldon, on grassy slope above timber-line, elevation 4,500 to 6,000 feet, Nos. 11613 and 11614. Also noted on upper Macmillan River, Mile 268, and in Macmillan Pass.

In Alaska-Yukon, previously known only from a few stations in Alaska and from a single station on the arctic coast of Yukon, but perhaps the most common member of the genus in southeastern Yukon where it is often ubiquitous on snowflushes of high mountains, frequently ascending to 6,000 feet. In such places the species flowers throughout the season, and expanding flowers and fully mature capsules may be seen in the same tussock. On Rose River flowering specimens were noted on June 11 and mature fruits on July 4.

Arenaria uliginosa Schleich. apud Lam. and DC., Fl. Fr. **4** : 786 (1805).

Minuartia stricta (Sw.) Hiern.

Alsine stricta (Sw.) Wahlenb., Fl. Dan., tab. 2962, Fasc. **50** : 7 (1880).

Alluvial flat west of Nisutlin River in wet places in river prairie near Mile 36, No. 10802; Rose River valley, in wet clay by a stream, Mile 77, No. 10278; upper Rose River, Mile 95, on a gravelly erosion fan, No. 10438; Rose-Lapie River pass, in wet places in alpine meadow, Mile 102, No. 10614; same place, in wet alpine tundra near summit of schist mountain east of Mile 105, elevation 6,000 feet, No. 9393; moraines at foot of granite mountain west of Mile 118, elevation 4,000 feet, No. 10128; Lapie River crossing, Mile 132, gravelly river-flats near Mile 132, No. 9681; Pelly River valley, wet, gravelly lake shore near Mile 136, No. 9660.

An eastern arctic-alpine species which, apparently, has not been recorded previously from Yukon or Alaska. In the National Herbarium of Canada is a single collection from Alaska: Wiseman, Anderson, No. 5885. In Rose-Lapie Pass *A. uliginosa* ascends to 6,000 feet elevation. Our No. 10128 had mature fruits on June 28.

Arenaria verna L. var. **pubescens** (Cham. & Schlecht.) Fern. in Rhod. **21**: 21 (1919).

Minuartia rubella Hult., Fl. Al. and Yukon **4** : 685 (1944), quoad pl. ex Yukon.

Whitehorse, Ear Lake, M. P. and R. T. Porsild, No. 29; pass between Teslin and Nisutlin Rivers, rocky summit of mountain east of Mile 14, No. 10991; Rose-Lapie Pass, on dry, grassy slopes near headwaters of Rose River, Mile 102, No. 10613; on rocky ledges of east slope of granite mountains, near Mile 118, elevation 5,000 feet, No. 10127; lower Lapie River crossing; dry, shaly slopes of mountain west of Mile 132, Nos. 9464 and 9709; rocky ledges near summit of mountain south of road, elevation 5,600 feet, Nos. 9608 and 9923; upper south fork of the Macmillan River on gravel outwash plain opposite Mile 280, No. 11305. Also from Mayo District, Bostock, No. 208; Kluane Lake, 6,000 to 7,000 feet elevation, Clarke, No. 229, and from northwest Yukon.

Occasional to common on dry, sunny slopes and ledges in the Pelly Range ascending to 5,600 feet. North of Pelly River noted only once. On Lapie River *A. verna* var. *pubescens* flowered on June 14.

Silene acaulis L. var. **exscapa** (All.) DC., Fl. Fr. **4** : 749 (1805); Hult., Fl. Al. and Yukon **4** : 694 (1944).

Dawson Range, 62° N., 138° W., Bostock, No. 2; McQuesten River, Christie, No. 34; Mayo District, Ladue Lake, Bostock, Nos. 49 and 50; Kluane Lake, Burwash Landing, 6,000 to 7,000 feet elevation, Clarke, No. 230; Anderson, No. 9422; Klotassin area, between Selkirk and White River, Cairnes, Can, No. 91894; Ogilvie Range, north fork of Klondike River, Cockfield, No. 17; 66° 15′ N. to 141° W., Cairnes, Can, No. 81247.

Two races of *S. acaulis* occur in North America. The var. *exscapa* is the arctic-alpine plant and is common from east Greenland to Alaska, and from latitude 83° N. in Greenland extends south to mountains of New Hampshire in the east and at least to Montana in the west. The var. *subacaulescens* is restricted to the West where it extends from Bering Strait through Yukon east to Mackenzie Delta and Bear Lake and south to Arizona and New Mexico but appears to be much less common than the var. *exscapa*. The geographical range of var. *subacaulescens* may, somehow, be related to the glacial history of the West, but if so our present floristic knowledge of the region is as yet too meagre to permit any definite conclusion. At any rate, the two varieties occasionally grow side by side, even on the same isolated mountain summit, whereas along the Canol Road only var. *subacaulescens* was noted. Elsewhere, again, they often occupy the same general range. Thus, var. *subacaulescens* is not, as inferred by Hultén, l.c., the only race occurring in central Alaska-Yukon, nor is it restricted there to the interior but reaches the Bering Sea as well as the eastern Pacific Coast.

In its extreme form, var. *subacaulescens* is strikingly distinct, with 3 to 5 cm. long, slender peduncles, often bearing a pair of leafy bracts, long cylindrical calyx and capsule, and leaves up to 35 mm. long. Intermediate forms, however, are frequently seen, as are long-peduncled forms of var. *exscapa*.

Silene acaulis L. var. **subacaulescens** (Williams) Fern. and St. John in Rhod. **23** : 120 (1921).

S. acaulis ssp. *subacaulescens* Hult., Fl. Al. and Yukon **4** : 696 (1944).

See also Hitchcock & Maguire in Univ. Wash. Publ. Biol. **13** : 22 (1947).

Rose-Lapie River pass, near Mile 105, on gravel bar by river, No. 9312; lower Lapie River crossing, grassy summit of mountain south of Mile 132, elevation 5,600 feet, Nos. 9927 and 9607; south and east face of Mount Sheldon, elevation 7,200 feet, No. 11741. In addition, the following collections from outside Yukon are in the National Herbarium of Canada; Alaska, Endicott Mountains, Wiseman, Anderson, No. 5889; Alaska Range, Healy, idem, No. 5755; Norton Sound, A. E. and R. T. Porsild, No. 908; Juneau, Anderson, No. 6242. Mackenzie District: north peak of Nahanni Mountains, Wynne-Edwards (together with var. *exscapa*), No. 8469; Great Bear Lake, Dease Arm, A. E. and R. T. Porsild, No. 4897; Richardson Mountain west of Mackenzie Delta, Porsild, No. 6787. Alberta: Shovel Pass, Jasper Park, Kindle, No. 93475. British Columbia: Selkirk Mountains, Rodger Pass, Macoun, No. 2554; summit of Kootanie Pass, Dawson, No. 2561.

The var. *subacaulescens* was noted as common on all mountains from the Teslin-Nisutlin pass to Macmillan Pass and was the only race seen by us on the Canol Road. On Mount Sheldon it ascends to 7,200 feet. In a large population on a mountain in the Pelly Range the male plant still flowered on June 26 when female plants had almost mature capsules (No. 9927). For notes on general distribution see under var. *exscapa.*

Silene Menziesii Hook. *See* Porsild, Rhod. **40** : 215 (1938); Hult., Fl. Al. and Yukon **4** : 697 (1944).

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 10665; Pelly River valley, open spruce and aspen woods, Nos. 9661 and 11172; Alaska Highway, Haines Junction, No. 11949. In Yukon previously known from Lake Atlin and the Dawson District.

The species flowered on June 17 and on July 28 had immature fruits.

In fruit *S. Menziesii* is always easily distinguished from the closely related *S. Williamsii* by its seeds, which are shiny and black when mature, whereas those of *S. Williamsii* are dull and strongly tuberculate.

Silene repens Patr.; Hult., Fl. Al. and Yukon **4** : 697 (1944).

S. purpurata Greene Pitt. **2** : 229 (1892).

S. repens ssp. *purpurata* (Greene) Hitchc. & Maguire in Univ. Wash. Publ. in Biol. **13** : 21 (1947).

Mackintosh, Alaska Highway, Mile 1122, Anderson & Brown, No. 10016; Haines Road, Dezadeash Lake, Clarke, No. 424; Alaska Highway, White River, Anderson, No. 9324; Dawson Range, latitude 62° 40′ N., longitude 138° W., Bostock, No. 245; Yukon River, Fort Selkirk, Gorman, No. 1044; McQuesten area, Campbell, No. 891; Dawson Dome, E. & J. Lohbrunner, No. 108; Dawson, Eastwood, No. 420; same place, August 6, 1899, Williams; same place, Malte, No. 104; same place, Moosehide Mountain, Macoun, No. 58404; same place, Hunker Creek, idem, No. 58405; north fork of Klondike, Cockfield, No. 19; Franklin, Fortymile district, Anderson and Brown, No. 7126; latitude 63° 25′ N., longitude 141° W., C. E. Cairnes, No. 54677; latitude 66° 25′ N., longitude 141° W., D. D. Cairnes, No. 81244; latitude 65° 18′ N., longitude 141° W., idem, No. 83051.

In North America *Silene repens* apparently is restricted to unglaciated parts of central Alaska, Yukon, and northwestern Mackenzie east to the Eskimo Lakes east of the Mackenzie Delta. It grows on dry, sandy, and gravelly places at low or moderate altitudes but is never alpine. Although apparently very common in the upper Yukon Valley, we did not find it in southeastern Yukon along the Canol Road.

Silene Williamsii Britt.; Hult., Fl. Al. and Yukon **4** : 698 (1944). *See* Porsild in Rhod. **40** : 214 (1938) and Hitchcock & Maguire in Univ. Wash. Publ. in Biol. **13** : 47 (1947).

In addition to the stations given by the writer and by Hultén, l.c., collected in southwest Yukon along Alaska Highway at Pine Creek, and at Macintosh, Anderson and Brown, Nos. 10324 and 10015.

An endemic species of central Yukon and Alaska of similar distribution as *S. repens,* but not extending into Mackenzie.

Melandrium affine J. Vahl. For a revision of arctic North American species of *Melandrium* see Porsild in Sargentia **4** : 31-37 (1943).

M. furcatum Hult., Fl. Al. and Yukon **4** : 702 (1944).

M. Taylorae var. *glabrum* Hult., Fl. Al. and Yukon **4** : 705 (1944), nomen confusum.

Lychnis funstoni Wight in Mertie in U.S. Dept. Int., Bull. **836** : 364 (1933), nomen nudum.

Lower Lapie River crossing, rare on stony ledges at summit of mountain south of Mile 132, elevation 5,600 feet, No. 9926; northeast shoulder of Mount Sheldon, steep rocky slopes, elevation 5,000 feet, No. 11076; south slope of Mount Sheldon, on moist ledges in ravine just below summit, elevation 7,200 feet, No. 11991. In the Yukon previously recorded from the Arctic Coast and from Dawson district.

Our plant is inseparable from material collected by the writer in the Mackenzie Delta and should, perhaps, be considered a geographical race of the circumpolar *M. affine* from which it differs by its short and broad calyx, nodding young flowers, and glabrous basal leaves. It is also a perfect match for a plant collected at Coal Creek Hill on Yukon River below Dawson by Fr. Funston, No. 81 (US and G)[1] and labelled "*Lychnis funstoni* Wight (ined.)", a nomen nudum published by Mertie, l.c. Hultén, l.c., for this plant published the new name *M. Taylorae* var. *glabrum* Hult. but gave no description and merely cited Wight's illegal publication. In his discussion Hultén remarks "This species [*sic*], of which I have seen the type specimen, can well be regarded as a high-grown inland race of *M. furcatum* [*affine*]"; his new varietal name under *M. Taylorae,* therefore, is a nomen confusum and should be discarded.

The following description of the Yukon plant is based on the large material in the writer's collection from Mount Sheldon: Perennial with a well-developed tap-root ending in a simple or few-headed crown; stems 15 to 30 cm. high, simple, slender and erect, short canescent-pubescent with 2 to 3 pairs of well-developed stem-leaves; basal leaves well developed, 3 to 6 cm. long, lanceolate, often with a prominent petiole, fresh green and mostly glabrous but sometimes ciliate along the margins; flowers mostly single, nodding when young, but in tall specimens often three together on short peduncles that toward maturity elongate and may become 8 cm. long; calyx glandular pubescent, campanulate, about 1·0 cm. long and 0·8 cm. broad, somewhat inflated, strongly marked with dark purple stripes ending in the very dark purple lobes; petals milky white, much exserted; seeds light brown with a narrow wing, granular.

In the interior of Yukon apparently restricted to high mountains. In Pelly Range it flowered on June 26 and on Mount Sheldon fruited during the second week of August.

Melandrium apetalum (L). Fenzl. *See* Porsild, l.c., 33.

M. apetalum ssp. *arcticum* Hult., Fl. Al. and Yukon **4** : 700 (1944).

Rose-Lapie River pass, wet gravelly places below summit of granite mountain west of Mile 116, elevation 5,000 feet, No. 10061; Mount

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[1] By the writer, l.c., erroneously cited under *M. Taylorae.*

Sheldon, on moist, rocky ledges in a ravine on east corner near summit, 7,200 feet elevation (where it grew near a colony of *M. affine*), No. 11743. In Yukon previously recorded from the Arctic Coast.

The species apparently is rare in southeast Yukon where it is limited to the highest mountains. Both specimens had almost mature fruits, the first on July 1 and the last on August 11.

Melandrium Ostenfeldii Porsild in Sargentia **4** : 37 (1943).

(Plate XIV, figures 1–3)

Lower Lapie River crossing, on dry, shaly slopes of mountain west of Mile 132, Nos. 9438 and 9466.

Melandrium Ostenfeldii was seen nowhere else but was quite common locally and on June 12 was mostly past flowering, with many capsules dehiscing. In the field our plant was thought to be a dwarfed form of *M. Drummondii* but on comparison with authentic material of that species and with the type of *M. Ostenfeldii*, proves without a doubt to belong to the latter species, hitherto known only from the type locality (on diabase ledges, Dease Bay, Great Bear Lake, N.W.T.). *M. Ostenfeldii* was based on over-mature material and differs from the present large series only by its somewhat taller growth and by being less glutinous. The following description of our plant, which is illustrated on Plate XIV, figures 1 to 3, was made from live material:

Densely caespitose with a very stout, often 2 cm.-thick tap-root and a much divided crown; the basal leaves numerous, linear-spatulate, about 2 cm. long and 0·4 cm. wide, often revolute, densely pubescent on both sides, with stiff, short hairs; the flowering stems stiffly erect, 10 to 20 cm. high, 1- to 3-flowered, densely glandular pubescent, with 1 to 2 pairs of linear stem leaves; calyx subcylindrical, 1 cm. long, glandular-viscid with broad, greenish stripes; petals white, barely exserted; seeds small, 0·8 x 0·6 mm., wingless, angular, dark brown, conspicuously granulate. The entire plant, but particularly the stems and calyces, is strongly glutinous in life.

Melandrium taimyrense Tolmatchev. in Trav. Mus. Bot. Acad. Sci. U.S.S.R. **24** : 264 (1932). *See* Porsild, l.c., 36.

M. Dawsonii Hult., Fl. Al. and Yukon **4** : 701 (1944).

Lychnis triflora, var. *Dawsoni* Robins. in Proc. Am. Acad. **28** : 149 (1893).

The Dawson collection, which is the type of *Lychnis triflora* var. *Dawsoni* and came from Dease River, B.C. (part of the Mackenzie drainage, not "Upper Yukon" as stated by Hultén, l.c.), is a close match for the series cited from the Northwest Territories (Porsild, l.c.). Although the writer has seen no specimens actually collected in the Yukon, the species, undoubtedly, is found there. Two hitherto unrecorded specimens, from central Alaska, are in the National Herbarium of Canada: Tanacross, Anderson, No. 8856, and Big Delta, idem, No. 8937. Both were distributed as *Lychnis taylorae*.

Melandrium Taylorae (Robins.) Tolmatchev. *See* Porsild, l.c. 35; Hult., Fl. Al. and Yukon **4** : 705 (1944), in part.

Klondike River, Macoun, No. 58402 (as *Lychnis triflora* var. *Dawsoni*).

A little known species, so far known only from northwest Mackenzie, central Yukon, and Alaska.

Vaccaria segetalis (Neck.) Garcke; Hult., Fl. Al. and Yukon **4** : 706 (1944).
V. vaccaria (L.) Britt.

An introduced weed, which has been collected several times at Dawson. Macoun, Can, No. 58407, on August 23, 1902, has fully mature fruits.

NYMPHAEACEAE

Nuphar polysepalum Engelm.; Hult., Fl. Al. and Yukon **4** : 707 (1944).

In a muskeg lake west of Nisutlin River, near Mile 42, No. 10803. In addition, water-lilies were observed in lakes near the road at Mile 163, 200, 203, and 213, all in the valley of Ross River, but, unfortunately, owing to the lack of a canoe or boat no specimens were obtained in these places. (Plate VII A.) Also McQuesten River, Christie, No. 38; Woodburn Lake, Bostock, No. 166.

According to Hultén, l.c., 708, the yellow water-lily in Alaska is *N. polysepalum* rather than *N. variegatum.* Our specimens, although in the shape of the leaf and in the number of sepals, stamens, and stigmatic rays they approach *N. variegatum,* probably should be referred to *N. polysepalum* as their stamens are reddish purple and the sepals and petals tinged with purple. The immature seeds, too, are oblong as in typical *N. polysepalum,* whereas in *N. variegatum* they are almost orbicular. Our specimens had flowers and immature fruits on July 26. On Lewes Lake, Mile 203, near Mount Sheldon, pond lilies almost covered the lake, and on August 8 appeared to have fully developed fruits. In Yukon previously known from a single collection on Lake Finlayson.

Nymphaea tetragona Georgi ssp. **Leibergii** (Morong) Porsild in Can. Field-Nat. **53** : 50 (1939).

This species was recently reported in Anderson, Flora of Alaska, and adjacent parts of Canada **5** : 313 (1946), from southeastern and central Alaska. In the National Herbarium of Canada are two collections from Alaska: Alaska Highway, near Canadian border, Anderson, No. 9160, and Anderson and Brown, No. 10242.

RANUNCULACEAE

Caltha leptosepala DC., Regni Veg. Syst. Nat. **1** : 310 (1818).

Lake Bennett, Macoun, Can, 58335; Haines Road near boundary, M. P. and R. T. Porsild, No. 247; Haines Road, Mile 85, Clarke, No. 527.

New to the flora of Yukon but recorded from adjacent parts of Alaska.

Caltha palustris L. var. **arctica** (R.Br.) Huth.; Hult., Fl. Al. and Yukon **4** : 711 (1944).

In Yukon known from Yukon Valley and from the Arctic Coast. Not seen by us along the Canol Road.

Actaea rubra (Ait.) Willd.; Hult., Fl. Al. and Yukon **4** : 716 (1944).

Densely wooded slope on east shore of Quiet Lake, Mile 55-60, No. 11114; in rich poplar woods at base of escarpment west of Nisutlin River, Mile 36, No. 10804. Also Haines Road, Mile 85, Clarke, No. 523.

Our specimens had mature fruits on July 23. In Yukon previously known from two stations on the Yukon River.

Aquilegia brevistyla Hook.; Hult., Fl. Al. and Yukon **4** : 718 (1944).

Whitehorse, sandy bluffs east of Lewes River, No. 10669; river-banks and alluvial flats west of Nisutlin River, Mile 36-42, No. 10805; lower Lapie River crossing, in open woods near Mile 132, No. 9517.

Common on calcareous shales north to Pelly River but not seen elsewhere. Our specimens flowered on June 15 and on July 23 had mature fruits. Apparently common in the Yukon Valley.

Aquilegia formosa Fisch. in DC. Prodr. **1** :50 (1824).

Steep west slope of granite range east of upper Rose River opposite Mile 95, elevation 4,600 feet, No. 10504; Rose-Lapie Pass, upper slope of schist mountain east of Mile 105, elevation 4,500 feet, Nos. 9394 and 10897. Also from Haines Road, Mile 85, Clarke, No. 520.

New to the flora of Yukon and seen by us only in the Pelly Range where the species flowered and fruited abundantly between July 17 and 21. In life the flowers emit a rather unpleasant odour.

Delphinium glaucum Wats.; Hult., Fl. Al. and Yukon **4** : 721 (1944). For discussion of nomenclature *see* Raup, Sargentia **6** : 176 (1947).

D. Brownii Rydb.; Ewan, in Univ. Cal. Stud. 2, **2** : 133 (1945).

Whitehorse, shaded banks of Lewes River, No. 9173; east slope of Rose River, near Mile 77, No. 10282; upper Rose Valley, open grassy places in river-flat, Mile 95, No. 10369; Rose-Lapie River pass, river-banks near Mile 105, Nos. 9248 and 9336; same place, alpine meadows on mountain east of Lapie Lake, elevation 5,000 feet, No. 10895; lower Lapie River, upper slopes of shaly mountain west of Mile 132, elevation 5,000 feet, Nos. 9713 and 9714; Pelly River valley, in rich poplar woods near Mile 136, No. 9850; upper south fork of Macmillan River, alpine meadows and snowflushes of shale mountain west of Mile 268, elevation 4,000 feet, No. 11349. Also noted as abundant in subalpine meadows on Mount Sheldon.

Delphinium glaucum apparently is not uncommon in mountainous parts of Yukon where it is largely restricted to alpine meadows and snowflushes having a deep, rich soil and an abundant water supply throughout the season. In some habitats with deep snow cover, it flowers late and rarely produces fruits. It ascends to 5,000 feet and in Pelly Valley flowered on June 23. Mature fruits were collected in late August on the Macmillan River.

The species varies considerably; thus in dry habitats the leaf-segments are narrow, the calyx varies in colour from dark to pale blue, and the follicles may be quite glabrous or distinctly pubescent. In alpine habitats the flowering stems, peduncles, and leaf petioles are strongly suffused with dark blue. Tall specimens measure 1·5 m.

Hultén, l.c., 722, remarks that "our plant has always glabrous follicles." As previously noted, this is not always the case. In fact, the young follicles are nearly always pubescent as are, sometimes, the fully mature ones. Rydberg, l.c., stated that the follicles are erect and glabrous, but as the writer ascertained by the examination of hundreds of plants near Banff, Alta., the type locality of *D. Brownii*, pubescent mature follicles are by no means rare. Ewan, l.c., who has taken up *D. Brownii* Rydb. for the northern plant as distinct from *D. glaucum* Wats., describes the follicles as being "oblong, erect, 12-14 mm. long, finely nervose, the cusp thin 3-4 mm. long," but curiously enough does not mention the pubescence, or lack thereof.

Aconitum delphinifolium DC.; Hult., Fl. Al. and Yukon 4 : 722 (1944).

Pass between Teslin and Nisutlin Rivers, treeless alpine meadow near Mile 10, 4,000 feet elevation, No. 11136; east slope of Rose River valley, in open woods near Mile 77, No. 10283; upper Rose River, in wooded riverflats near Mile 95, No. 10370; Rose-Lapie River pass, Mile 105, in spruce bog, No. 9335; same place, alpine meadow, No. 9800; lower Lapie River crossing, alpine meadows on shale mountain west of Mile 132, elevation 5,000 feet, No. 9711. In addition the species was recorded from most other places where collections were made, north to Macmillan Pass.

A common species in the Yukon most often growing in alpine meadows and on snowflushes where it ascends at least to 5,600 feet. It flowers somewhat later than *Delphinium glaucum* with which it is often associated. Mature fruits were collected on Macmillan River in late August.

Pulsatilla ludoviciana (Nutt.) Heller, Cat. N. Am. Pl., ed. **2** : 4 (1900).

P. patens ssp. *hirsutissima* Zamels in Acta Hort. Bot. Latv. **1**: 101 (1926), not *Clematis hirsutissima* Pursh.

Anemone patens L. var. *Wolfgangiana* (Bess) Koch.

A. patens ssp. *multifida* Hult., Fl. Al. and Yukon **4** : 738 (1944), not Pritzel (the transfer to *Anemone* by Hultén wrongly attributed to Zamels).

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 9174; lower Lapie River crossing, common on dry, grassy slopes near Mile 132, No. 9271. Also from the Arctic Coast and from numerous stations in the Central Yukon Plateau.

On the Canol Road noted as common on dry, calcareous slopes between Whitehorse and Pelly River but not seen again by us until Macmillan Pass. It flowers very early and on Lapie River had mature fruits on June 10.

Hultén, l.c., considers the American plant inseparable from ssp. *multifida* (Pritzel) l.c., 98, of Altai, Lake Baical, Amur, and northern Manchuria, whereas Zamels, because of differences in the segmentation of the leaf (compare Zamels, figure 10 b), believes it to be distinct. The range of *Pulsatilla ludoviciana* strongly favours the view that it is a distinct American western and montane race that barely enters Alaska, where it is restricted to the mountains of the eastern central parts.

Anemone Drummondii S. Wats.; Hult., Fl. Al. and Yukon **4** : 728 (1944).

Rose-Lapie River pass, in gravelly soil at summit of mountain east of Mile 105, elevation 6,000 feet, No. 10893; lower Lapie River crossing, grassy summit of mountain south of Mile 132, Nos. 9595, 9612, and 9929; summit of schist mountain west of Mile 132, No. 9710. Also from Haines Road, Mile 85, Clarke, No. 526.

In southeastern Yukon the species was rare and restricted to the highest peaks of the Pelly Range where, in gravelly or shaly places at 5,600 feet elevation, it had immature fruits on June 20. In Yukon previously recorded from the Arctic Coast and from Old Crow River.

Hultén, l.c., pp. 728, 730, in comparing this species with the closely related *A. multiceps,* remarks that the filaments of the latter are blue and the styles wine-red, whereas in *A. Drummondii* the filaments and styles are said to be "yellowish". In all our specimens, as well as in several sheets from the Rocky Mountains in the National Herbarium of Canada, the filaments are dark blue and the styles as red as in *A. multiceps.* Otherwise our specimens agree with typical *A. Drummondii* and have much smaller flowers than has *A. multiceps.*

Anemone multiceps (Greene) Standley; Hult., Fl. Al. and Yukon **4** : 729 (1944).

A rare endemic species of unglaciated mountains of Alaska and Yukon which, in the Yukon, has been collected several times along the International Boundary, near the Arctic Circle.

Anemone multifida Poir.; Hult., Fl. Al. and Yukon **4** : 730 (1944).

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 10637; Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 405; grassy alluvial flats west of Nisutlin River, Mile 36-42, No. 10806; lower Lapie Crossing, dry, shaly slopes of mountain west of Mile 132, No. 9467; same place, dry, gravelly river terraces, No. 9542; Pelly River valley, common on dry, burnt-over slopes, near Mile 136, No. 9663.

Anemone multifida is common at Whitehorse and in Pelly Range but was not seen north of Pelly River and apparently is restricted to dry, calcareous lowland slopes of the central Yukon Plateau. Along the Canol Road it flowered the second week of June and had mature fruits on July 23. The flowers are pink or creamy white.

Anemone narcissiflora L., Sp. Pl. **1** : 542 (1753).

A. narcissiflora ssp. *interior* Hult., Fl. Al. and Yukon **4** : 734 (1944). *See* also Raup, Sargentia **6** : 178 (1947).

Rose River valley, alpine slopes east of Mile 77, No. 10951; Rose-Lapie Pass, uncommon in spruce swamp near Mile 105, elevation 4,000 feet, No. 9313; lower Lapie River crossing, grassy summit of mountain south of Mile 132, Nos. 9418 and 9928. In addition, observed in many places between Mile 14 and Macmillan Pass. Also McQuesten River, Christie No. 39; north fork of Klondike River, Cockfield, No. 21; 68° 18′ N., 141°

W., Cairnes, Nos. 15 and 16; Dawson Range, Bostock, No. 3; Mayo district, idem, No. 56; Kluane Lake, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 233.

In southeastern Yukon, *A. narcissiflora* is a primary species in alpine tundra and on herbmats above timber-line. On Mount Sheldon it ascends to 7,200 feet. According to Hultén, l.c., the race inhabiting the mountains of central Alaska and Yukon is ssp. *interior* Hult. The plant of interior Yukon, as represented by our series, is very variable as to degree of hairiness, height, and number and size of flowers, and can scarcely be distinguished from ssp. *sibirica* (L.) Hult. of the Bering Strait region. At low elevations fruiting specimens sometimes measured 46 cm. and often were 2- to 3-flowered, whereas the high-alpine form is low and usually 1-flowered.

In Pelly Range *A. narcissiflora* flowered on June 10, and on June 26 specimens with almost mature fruits were collected. It is a strikingly handsome species.

Anemone parviflora Michx.; Hult., Fl. Al. and Yukon **4** : 736 (1944).

Whitehorse, in mossy spruce woods east of Lewes River, No. 9172; Rose-Lapie Pass, in a spruce bog near Mile 105, No. 9317; same place, in alpine meadow, No. 9801; lower Lapie River, in gravelly river-flat near Mile 127, No. 10016; Pelly River valley, in open spruce woods near Mile 136, No. 9851.

Throughout the Yukon *A. parviflora* is a common or even ubiquitous species of open spruce woods, gravelly river-flats, alpine meadows, and snowflushes; on Mount Sheldon it ascends to 7,200 feet.

As noted by Hultén l.c., the size of the flowers varies greatly; usually they are about 2 cm. in diameter, with sepals pale blue on the outside; but pure white flowers up to 4 cm. in diameter (No. 9317) are not uncommon. Fully expanded flowers were noted the first week of June, and on Pelly River mature fruiting specimens were collected on June 23. In shaded or moist habitats flowering specimens may be found throughout the season.

Anemone Richardsonii Hook.; Hult., Fl. Al. and Yukon **4** : 740 (1944).

Rose-Lapie Pass, in a spruce bog near Mile 105, No. 9337; lower Lapie River crossing, in wet places by alpine brook on mountain south of Mile 132, elevation 4,500 feet, No. 9611; same place, in mossy, spruce woods on mountain west of Mile 132, No. 9712; Pelly River valley, mossy places by a muskeg lake, Mile 136, No. 9662; in saddle between Mount Sheldon and Mount Riddell, elevation 4,300 feet, No. 11675.

Common to occasional throughout the Yukon in mossy places from the lowland to well above timber-line, north to the Arctic Coast. At Mile 95 ascending to 5,600 feet. Expanded flowers were first noted on June 10 and mature fruits on June 23.

Ranunculus abortivus L., Sp. Pl. **1**: 551 (1753).

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, Nos. 538 and 749; east slope of Rose River valley, in meadows near Mile 77, No. 10284; in subalpine meadows on northeast spur of Mount Sheldon, Mile 226, No. 11473.

Hultén, l.c. 745, thinks that *R. abortivus* "is probably a weed within our area," but, in southeast Yukon at least, it is most certainly indigenous and may belong to a race distinct from the widely ranging weedy plant from which it differs chiefly by its slender, delicate growth. Our specimens are a perfect match for those collected by Raup in the Wood Buffalo Park and on Peace River, Hudson Hope, Raup and Abbe, No. 3639 (Can). On Rose River *R. abortivus* fruited abundantly on July 3. The species is new to the flora of Yukon.

Ranunculus aquatilis L. var. **capillaceus** (Thuill.) DC. *See* Benson in Bull. Torr. Bot. Cl. **69** : 381 (1942).

R. trichophyllus Chaix.

Johnson Crossing, Mile 0, M. P. and R. T. Porsild, No. 742; Whitehorse, on bottom of Lewes River, in 5 to 6 feet of swift-running water, No. 10668. With flowers and young fruits on July 28.

Ranunculus aquatilis L. var. **eradicatus** Laest. *See* Benson in Bull. Torr. Bot. Cl. **69** : 383 (1942).

Batrachium confervoides Fr.

Pass between Teslin and Nisutlin Rivers, in a shallow pond near Mile 14, elevation 4,500 feet, No. 11039; same place, M. P. and R. T. Porsild, No. 720; Rose-Lapie River pass, in shallow, marly ponds in a flat near headwaters of Rose River, Mile 98-99, No. 11903.

Our specimens were totally submerged in water about 18 inches deep and had flowers and young fruits on July 12 and 30, respectively. The var. *eradicatus* was not noted elsewhere but is probably not uncommon in suitable places.

Ranunculus Cymbalaria Pursh; Hult., Fl. Al. and Yukon **4** : 750 (1944).

Whitehorse, in wet, sandy places east of Lewes River, No. 10667. Our specimens belong to the var. *alpina* Hook.; it had flowers and mature fruits on July 28. Previously recorded from Yukon Valley and common in the interior along the Alaska Highway.

Ranunculus Eschscholtzii Schlecht., Animadv. Bot. Ran. Candollii **2** : 16 (1820).

Pass between Teslin and Nisutlin Rivers, in treeless, alpine meadow, No. 11137; east slope of Rose River valley, alpine summit, elevation 6,000 feet, No. 10168; alpine slopes and snow patches of mountain range west of upper Rose River, Mile 95, elevation 5,000 feet, Nos. 10206 and 10207; upper Rose River, gravelly outwash plain near Mile 95, Nos. 10440 and 10455; south shoulder of Mount Sheldon, alpine, grassy slopes above timber-line, elevation 5,500 feet, No. 11615; Mount Sheldon, steep ravines of southeast slope, elevation 6,000 feet, No. 11744; upper south fork of Macmillan River, on snowflushes above timber-line on shale mountain west of Mile 268, Nos. 11347 and 11348. Also Mayo District, Bostock, Nos. 58, 59, and 209; Haines Road, near boundary, M. P. and R. T. Porsild, Nos. 181 and 248.

The large series shows a considerable range of variation, not only seasonal but also in the size of flower, shape of leaf, and degree of pubescence. This is probably due to the free intercrossing between *R. Eschscholtzii* and *R. nivalis,* which undoubtedly takes place where the species occur together, as they do on all the higher mountains.

Although not previously recorded from Yukon, *R. Eschscholtzii* is common in the mountains at least to 6,000 feet and is ubiquitous in places where the snow remains late. Fruiting axes were first seen on July 6, but near snowfields flowering specimens may be seen throughout the season.

Ranunculus gelidus Karel. & Kiril.; Ostf. Gjöa Exp. 44 (1909); Porsild, Sargentia **4** : 38 (1943); Hult., Fl. Al. and Yukon **4** : 753 (1946).

R. Grayi Britt.

In Yukon so far recorded only from the Arctic Coast but found also on the adjacent Richardson Mountains west of the Mackenzie Delta and in the Rocky Mountains. The species probably occurs also in the Ogilvie Range and elsewhere in northwest Yukon.

Ranunculus Gmelini DC.; Hult., Fl. Al. and Yukon **4** : 755 (1944).

R. yukonensis Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2,** 6 : 169 (1901).

R. Purshii ssp. *yukonensis* Porsild in Rhod. **41**: 229 (1939).

R. Gmelini var. *yukonensis* (Britt.) Benson in Bull. Torr. Bot. Cl. **69** : 314 (1942).

Johnson Crossing, M. P. and R. T. Porsild, No. 513; lower Lapie River crossing, on wet, peaty soil along a muskeg trail near Mile 132, Nos. 9545 and 10035 (f. *terrestris*); Pelly River valley, in a slough near Ross trading-post, No. 9690. Noted as common from Mile 39 on the Nisutlin River north to Sheldon Lake, Mile 222.

Apparently common in the central and northern parts of Yukon. On the Lapie River flowering and fruiting specimens (f. *terrestris*) were collected on June 16.

Ranunculus hyperboreus Rottb.; Hult., Fl. Al. and Yukon **4** : 757 (1944).

In sloughs and ponds on alluvial flat west of Nisutlin River, Mile 36, No. 10807; upper Rose River valley, Mile 95, in shallow ponds in river-flat, No. 10371; south fork of Macmillan River, in a slough near Mile 250, No. 11424; upper Macmillan River, in ponds in outwash plain opposite Mile 280, No. 11306.

Occasional to rare in small ponds and sloughs. On Nisutlin River the species had mature fruits on July 23.

Ranunculus lapponicus L.; Hult., Fl. Al. and Yukon **4** : 758 (1944).

East slope of Rose River valley, in wet places in spruce bog near Mile 77, No. 10285; lower Lapie River crossing, in sphagnum bog near Mile 132, No. 9575; muskeg slope at base of Mount Sheldon, No. 11077.

A common or even ubiquitous species in sphagnum bogs, particularly in black spruce muskeg. On Lapie River specimens with expanded flowers and immature fruits were collected on June 17.

Ranunculus Macounii Britt.; Hult., Fl. Al. and Yukon **4** : 759 (1944).

Johnson Crossing, M. P. and R. T. Porsild, No. 537; northeast spur of Mount Sheldon, in wet places and by edge of summer-dry, shallow ponds in subalpine meadows near Mile 226, No. 11472.

Typical specimens 50 cm. tall, with flowers and mature fruits, were collected on August 4. The species, which apparently is rare and local in our area, has been recorded previously from Whitehorse.

Hultén, l.c., expresses doubt as to whether or not *R. Macounii* is indigenous in the area. Our new station at Mount Sheldon was made accessible by the new road only a few months before our arrival and is so remote from settled districts that there can be little doubt that the species is indigenous there.

Ranunculus nivalis L.; Hult., Fl. Al. and Yukon **4** : 760 (1944).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, No. 10993; upper Rose River, alpine slope by a glacial stream west of Mile 95, Nos. 10204 and 11928; lower Lapie River crossing, grassy summit of mountain south of Mile 132, No. 9610. Also noted in Macmillan Pass.

Occasional to rare on high mountains where it is often associated with *R. Eschscholtzii*; when this happens, hybrids are undoubtedly formed that may be referred equally well to either species. Normally *R. nivalis* is taller and more robust than *R. Eschscholtzii*; its fruiting heads tend to elongate toward maturity, and the achenes are considerably larger. In life the pubescence of the sepals in typical *R. nivalis* is brownish black, whereas that of *R. Eschscholtzii*, besides being less dense, is of a paler brown. This character, however, is unreliable in places where the two species meet; thus, at Mile 95, all transitions, from pale brown to almost black sepals, were noted. Furthermore, the colour of the pubescence of the sepals tend to fade in drying.

Ranunculus nivalis usually grows in small clumps in wet moss by cold alpine brooks and flowers later than *R. Eschscholtzii.* The latter species flowers almost immediately the snow disappears and prefers snowflushes and alpine meadows where it is often a dominant species.

At Lapie Crossing *R. nivalis* was first noted in flower on June 15, and almost mature fruits were collected a month later. Near snowbanks both species may be seen in flower throughout the summer. In Yukon previously recorded from Dawson District and from the Arctic Coast.

Ranunculus occidentalis Nutt. var. **brevistylis** Greene in Pitt. **3** : 14 (1896).

Upper Rose River, alpine valley west of Mile 95, elevation 5,600 feet, No. 10565. Also collected in southwest Yukon, Haines Road, Mile 85, Clarke, No. 519. Determination kindly verified by Dr. L. Benson.

Plant glabrous except for a thin, soft pubescence on the petioles, the underside of the leaves, and on the peduncle just below the flowers; basal leaves mostly 3-lobed; flowering stems weak and slender, 20 to 25 cm. high; fully expanded flowers 15 to 18 mm. in diameter, sepals strongly reflexed, 5 petals, obovate, butter yellow; achenes strongly flattened, with a short, conical, abruptly hooked beak.

By its slender growth, absence of long, spreading pubescence on the petioles and lower parts of the stem, our plant differs strikingly from any *R. occidentalis* known to the writer. Our specimens grew in a luxurious alpine meadow and had flowers as well as almost mature fruits on July 15-16. The var. *brevistylis* apparently is rare and local in Yukon; on the Canol Road we did not see it elsewhere. It is new to the flora of Yukon where no race of *R. occidentalis* has previously been recorded.

Ranunculus Pallasii Schlecht.; Porsild, Sargentia **4** : 38 (1943); Hult., Fl. Al. and Yukon **4** : 764 (1944).

In Yukon known thus far only from the Arctic Coast (Porsild, No. 6905).

Ranunculus pedatifidus Sm. *See* Fern. in Rhod. **36** : 93–96 (1934). Pls. 279-280.

R. vicinalis Green in Pitt. **4** : 145 (1900).

R. Eastwoodianus Benson in Am. Journ. Bot. **27** : 804 (1940).

R. affinis Hult., Fl. Al. and Yukon **4** : 746 (1944).

In Yukon, *R. pedatifidus*, like a number of other species, apparently is restricted to the central plateau where it has been collected a number of times along the Yukon. We did not see it along the Canol Road or in the Mackenzie Mountains, nor does Raup report it from Brintnell Lake or from upper Mackenzie Basin. On the other hand, the species is common in the northern part of Mackenzie District.

Ranunculus Purshii Richards. in Franklin 1st. Journ. App. 1, p. 741 (1823); Hook., Fl. Bor.-Am. **1**, tab. 7B. (1833).

R. Gmelini DC. var. *Purshii* (Richards.) Hara in Rhod. **41**: 386 (1939) in part, excl. syn. *R. yukonensis* Britt.

Johnson Crossing, M. P. and R. T. Porsild, Nos. 460 and 748; Kluane Lake, Clarke, No. 236.

Ranunculus Purshii is closely related to *R. Gmelini* which, generally speaking, has a more northern range, extending from arctic Europe through Siberia, northern Alaska, and Yukon east to the west shore of Hudson Bay, whereas *R. Purshii* appears to be restricted to North America where it is a woodland species which from the East barely reaches into Yukon and Alaska.

Ranunculus pygmaeus Wahlenb., Fl. Lapp. 157 (1812).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, No. 10994; upper Rose River, alpine valley west of Mile 95, No. 10205; Rose-Lapie Pass, in a ravine near summit east of Mile 105, elevation 5,500 feet, No. 10894. Noted also on Mount Sheldon and in Macmillan Pass. Also from Mayo district, Bostock, No. 209, and McQuesten River, Christie, No. 43.

An arctic-alpine species seen only above timber-line where it is nearly always restricted to snowflushes and north slopes or ravines where the snow remains late. In such places it flowers from early July. On Mount Sheldon noted to 6,000 feet elevation. New to the flora of Yukon.

Ranunculus reptans L.; Hult., Fl. Al. and Yukon **4** : 767 (1944).

Johnson Crossing, M. P. and R. T. Porsild, No. 459; Rose-Lapie Pass, on wet, gravelly shores of small ponds near Mile 98-99, No. 11902; northeast spur of Mount Sheldon, edge of summer-dry ponds and sinkholes near Mile 226, elevation 3,400 feet, No. 11474. Also Mayo District, Kalzas Twins, Bostock, No. 57; Mayo, Anderson, No. 9682; Pelly Banks, Dawson, Can, 1170. Noted as common along the Alaska Highway west of Whitehorse.

Noted only as stated above but probably common in suitable places. Number 11474 from Mount Sheldon and the plant from Johnston Crossing are the broadleaved, terrestrial var. *intermedius* (Hook.) T. & G. with 3 mm. broad, lanceolate leaves; the common form in the Arctic is wholly submerged and has narrow, filiform leaves.

In our area *R. reptans* is a late-flowering species which in Rose-Lapie Pass flowered on July 12 and on Mount Sheldon on August 4.

Ranunculus sceleratus L. ssp. **multifidus** (Nutt.) Hult., Fl. Al. and Yukon **4** : 768 (1944).

Whitehorse, M. P. and R. T. Porsild, No. 68; lower Lapie River crossing, in wet, peaty soil by a muskeg trail near Mile 132, Nos. 9543, 9544, and 10034; Pelly River, by edge of slough near Ross trading-post, No. 9689.

In our area perhaps a southern species. *See* notes on p. 35. Flowering and fruiting specimens collected June 16-20.

Ranunculus Turneri Greene in Pitt. **2** : 296 (1892); Hult., Fl. Al. and Yukon **4** : 771 (1944).

R. occidentalis var. *robustus* Ostenf. in Chria. Vidensk. Selsk. Skr. 1909, **8** : 46 (1910).

R. occidentalis var. *Turneri* Benson in Bull. Torr. Bot. Cl. **68** : 167 (1941).

R. acris L. var. *frigidus*, sensu Porsild, Sargentia **4** : 38 (1943).

Apparently a rare species in Yukon where, so far, it has been collected only a few times along the Arctic Coast and in adjacent parts of Alaska and Northwest Territories (Richardson Mountains, Porsild, No. 6810).

Thalictrum alpinum L.; Hult., Fl. Al. and Yukon **4** : 773 (1944).

Upper Rose River, in flood-plain meadow by a brook near Mile 95, No. 10538; Rose-Lapie River pass, in subalpine meadow near headwaters of Rose River, Mile 98-99, No. 11901; in similar place near Mile 105, No. 9799. Noted also in pass between Teslin and Nisutlin Rivers, Mile 14.

In our area *Th. alpinum* apparently is restricted to the Pelly Range where it, moreover, was found only in certain types of subalpine flood-plain meadows at elevations between 3,000 to 4,000 feet but never in truly alpine meadows. In Rose-Lapie Pass it flowered on June 22 and a month later had young fruits.

The species apparently is rare in Yukon where it has been collected only a few times before, in the Dawson Range, latitude 62 degrees, longitude

138 degrees, near the source of Klaza River by Hugh Bostock, No. 22 (Can), Haines Road, Mile 85, Clarke, No. 528, and Lake Kluane by A. Müller.

Thalictrum Breitungii Boivin in Can. Field-Nat. **62** : 168 (1948).

Th. occidentale Hult., Fl. Al. and Yukon, **4** : 774 (1944) not Gray, at least in part.

Rose-Lapie Pass, locally common in alpine meadow on mountain east of Mile 105, elevation 5,000 feet, No. 10896 (Type). Also from Haines Road, Mile 85, Clarke, No. 529; same place, near boundary, M. P. and R. T. Porsild, No. 187.

Our specimens are metre-tall and grew in a rich meadow together with *Delphinium glaucum, Aquilegia formosa, Veratrum Eschscholtzii, Heracleum lanatum* a.o., and on July 21 had almost mature fruits.

Thalictrum sparsiflorum Turcz. var. **Richardsonii** (Gray) Boivin in Rhod. **46** : 369 (1944).

Th. sparsiflorum Hult., Fl. Al. and Yukon **4** : 774 (1944).

Northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, elevation 3,400 feet, No. 11471; Ross River valley, in meadows by north end of Sheldon Lake, Mile 222, No. 11552; south fork of Macmillan River, in river-bank meadows near Mile 250, No. 11425.

Th. sparsiflorum var. *Richardsonii* is common in subalpine meadows of Mount Sheldon and upper Ross River valley where it constituted one of the dominant species together with *Delphinium glaucum, Rumex arcticus, Ranunculus Macounii, Geum macrophyllum* ssp. *perincisum, Polemonium acutiflorum, Mertensia paniculata, Arnica Chamissonis,* and others. In the deep, rich soil of these meadows it grew to one metre high, with richly branched stems, and had fully mature fruits on August 1.

In the Yukon previously recorded from Dawson District.

PAPAVERACEAE

The taxonomy of the North American arctic and boreal members of the genus *Papaver* in several respects resembles that of the genus *Dryas*, in which one species (*Dr. integrifolia*) occupies practically all of the glaciated land surface north of the tree limit; whereas in unglaciated parts of Alaska-Yukon, as well as in the high mountain regions, a number of distinct species or races have been recognized.[1] Thus, in the genus *Papaver*, one species, *P. radicatum*, is common from west Greenland to Mackenzie and from the tree-line extends to the northern extremity of Ellesmere Island and Greenland. Within this large area *P. radicatum* is the only species of *Papaver* and, moreover, excepting the white-flowered var. *albiflora*, shows a remarkable lack of ecotypes. On the other hand, in Alaska-Yukon recent collecting has brought to light a multitude of highly perplexing races. Some of these apparently intergrade freely and until studied in culture cannot be satisfactorily dealt with; whereas others, including *P. Walpolei* and *P. McConnellii*, seem very distinct. In the following classification of the Yukon material now before me, I have followed Hultén's preliminary treatment, in his Flora of Alaska and Yukon, which is adequate for the material examined by him but tends to break down when a larger material is available.

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[1] Compare Porsild, A.E.: The Genus *Dryas* in North America, Can. Field-Nat. 61: 175-192 (1947).

Papaver alaskanum Hult., Fl. Aleut. Isl. 190 (1937), tab. 10; Porsild in Sargentia, **4** : 39 (1943).

P. microcarpum sensu Porsild in Sargentia **4** : 39 (1943), in part.

Arctic Coast west of Mackenzie Delta, Porsild, Nos. 7138 and 7179; Herschel Isl., Can. Arct. Exp. No. 239; Dawson Range, Britannia Creek, Bostock, No. 247.

Papaver alaskanum according to Hultén, l.c., p. 800, is restricted to the western Pacific coast of Alaska and the Bering Sea region; but in the Yukon and also along the arctic coast of Mackenzie District, a plant occurs which closely matches the plant Hultén described from the Aleutian Islands and distinguishes "from *P. radicatum* and other closely related types [by its] very conspicuous, thickly packed light-brown sheaths, which are strongly bristly, especially in the margin." To this might be added that the petals are sulphur-yellow, as in *P. radicatum*, but do not turn bluish green in drying, as is often the case in the latter species. It should be noted, however, that when growing in turfy places the caudices of *P. radicatum* may also elongate and in time become covered with persisting old sheaths, as in *P. alaskanum*.

Papaver alboroseum Hult. in Fl. Kamtchatka 141 (1928), tab. 3., fig. 3.

This species, which was previously known only from Kamtchatka and Anadyr, was recently reported by Hultén from Seward on the Pacific coast of Alaska. In the National Herbarium of Canada is preserved a collection from Yukon, latitude 62° N., 141° W., Cairnes, Can, No. 85872, with brick-red petals and ovoid capsules. In its leaf-segmentation, colour of petals, and in the shape of its capsules, the Yukon plant closely simulates the very rare and isolated *P. pygmaeum* Rydb. of high peaks of Montana, southern Alberta, and British Columbia, which, however, has perfectly glabrous leaves. Dr. Bostock of the Geological Survey of Canada informs me that he saw specimens identical to the Cairnes collection above timberline west of Burwash Landing, Kluane Lake. The species is new to the flora of Yukon.

Papaver Keelei Porsild in Nat. Mus., Canada, Bull. **101**: 20 (1945).

P. microcarpum Porsild in Sargentia **4** : 39 (1943), not DC., in part.

(Plate XVI, figures 4-7)

From the east slope of Mackenzie Mountains, N.W.T., this endemic of the northern Cordillera apparently extends north almost to the Arctic Coast where it was reported erroneously by the writer, l.c., as *P. microcarpum* (Porsild, Nos. 6814, 6815, and 6669); it probably will turn up also on calcareous mountains of central Yukon.

Papaver Macounii Greene var. **discolor** Hult., Fl. Al. and Yukon 4 : 803 (1945).

P. microcarpum sensu Porsild in Sargentia **4** : 39 (1943), in part; idem in Rhod. **41** : 231 (1939).

Dawson Range, Britannia Creek, Bostock, No. 248; Alaska Highway at White River, Anderson, No. 9327; Kluane Lake, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 238. Also from Richardson

Mountains west of Mackenzie Delta, Porsild, No. 6592, and according to Hultén, l.c., from Coppermine River, N.W.T. The species is new to the flora of Yukon.

Papaver McConnellii[1] Hult., Fl. Al. and Yukon **4** : 803 (1945).

As predicted by Hultén, this apparently well-marked species, known to him only from the type locality in mountains between Peel River and La Pierre House, latitude 67°-68° N., Yukon (not N.W.T., as stated by Hultén), July 1888, McConnell (Can, No. 1464), has since turned up in Alaska. Thus, there are before me two sheets from Healy in the Alaska range, both Anderson, No. 5750, which perfectly match the type.

Papaver nudicaule L.; Hult., Fl. Al. and Yukon **4** : 803 (1945).

In central Yukon and Alaska a tall, large-flowered poppy with narrow capsules and sulphur-yellow or white petals occurs which Hultén, l.c., states is indistinguishable from Asiatic *P. nudicaule*. To the writer the colour of the petals suggests relationship with the *P. radicatum–P. Macounii* group rather than with the orange-yellow petalled *P. nudicaule*.

Papaver radicatum Rottb. ssp. **occidentale** Lundstr. in Acta Hort. Berg. **7**, 5 : 413 (1923).

East side of Rose River valley, rocky north slope of granite mountain opposite Mile 85-90, elevation 6,000 feet, No. 10169; granite mountain range west of upper Rose River opposite Mile 95, rocky summit, elevation 6,700 feet, No. 11930. Also from north fork of Klondike River, Cockfield, No. 23, latitude 66° 10′ N., 141° W., Cairnes, Can, No. 81190; Mayo District, Black Ram Creek, Bostock, No. 210; Arctic Coast, Herschel Island, Stringer, Can, No. 12932.

By its elongated caudices that are covered by the persistent sheaths of old leaves, *P. radicatum* ssp. *occidentale* approaches *P. alaskanum* Hult. but, unlike typical *P. radicatum*, its petals do not turn greenish in drying.

In Yukon this is apparently a rare species, which along the Canol Road was restricted to high mountain peaks where it flowered in mid-July.

Corydalis aurea Willd.; Hult., Fl. Al. and Yukon **4** : 809 (1945).

Whitehorse, M. P. and R. T. Porsild, No. 30; Johnson Crossing, idem, Nos. 302, 490, and 721; river-banks and alluvial flats along west bank of Nisutlin River. Mile 36-42, elevation 2,750 feet, No. 10808; Pelly Valley, in wet, turfy places along bulldozer trail near Mile 136, No. 9664. Also from Mayo District, Bostock, Nos. 61 and 62; the Dawson District and from southwest Yukon.

Noted as common between Whitehorse and Pelly River where it was a pioneer species in wet, fresh soil by roadsides. On Nisutlin River the species was fruiting on June 26.

Corydalis pauciflora (Steph.) Pers.; Hult., Fl. Al. and Yukon **4** : 810 (1945).

Granite mountain west of upper Rose River opposite Mile 95, in wet, gravelly, somewhat shaded places by a mountain brook near timber-line, 5,000 feet, Nos. 10209 and 11929; same place, No. 10208 (type of var.

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[1] Published as *P. McConellii* which, obviously, is a typographical error.

albiflora). Also, Mayo, latitude 63° 40′ N., longitude 134° 20′ W., Bostock, No. 62; latitude 64° 57′ N. and 134° 52′ W., idem, No. 61, Dawson District, and Klotassin Area.

A very delicate and pretty species which appears to be restricted to rather moist, somewhat shaded habitats of alpine regions near and above timber-line.

Most of our specimens are 2-, less commonly 3-flowered; the flowers are large, measuring 1·8 to 2·0 cm. in length and with a perfectly straight spur. The corollas are pale sky-blue, except in one small colony of pure white-flowered specimens: var. **albiflora** n. var., corolla alba, ceterum ut in specie.

During early anthesis the anthers are pressed against the stigma so that self-pollination seems unavoidable.

Corydalis sempervirens (L.) Pers.; Hult.; Fl. Al. and Yukon **4** : 812 (1944).

Johnson Crossing, M. P. and R. T. Porsild, No. 305; west bank of Nisutlin River near Mile 36-42, No. 10809; lower Lapie River crossing near Mile 132, No. 9576; south and east slopes of Mount Sheldon, in steep ravines near timber-line opposite Mile 222, No. 11720. Also Mayo District, Bostock, No. 60.

Apparently common in the central and southern part of the area, becoming progressively less common northward where the species was last seen on Mount Sheldon. On Nisutlin River flowering and fruiting specimens were collected on July 23. Like *C. aurea*, it pioneers on newly cleared land and is often found by roadsides and in brulés.

CRUCIFERAE

Subularia aquatica L.; Hult., Fl. Al. and Yukon **5** : 813 (1945).

Rose-Lapie River pass, in a pond near headwaters of Rose River, elevation 4,000 feet, Nos. 11904 and 11914; Sheldon Lake in a shallow bay near trading-post, No. 11503.

Our specimens grew in shallow water with *Isoëtes Braunii* and fruited on August 16. In Yukon previously known from Whitehorse.

Lepidium densiflorum Schrad.; Hult., Fl. Al. and Yukon **5** : 814 (1945).

Whitehorse, dry gravelly roadsides near the town, No. 9177; flowering specimens on June 7; Johnson Crossing, common in waste places, M. P. and R. T. Porsild, Nos. 612 and 753; also Alaska Highway, Mile 988, Anderson and Brown, No. 10333. An introduced weed.

Thlaspi arvense L., Sp. Pl. **1**: 646 (1753).

Quiet Lake, in a clearing by abandoned road camp, Mile 55, almost mature fruits on July 4, No. 11115. Occasional, introduced weed.

Thlaspi arcticum Porsild in Sargentia **4** : 40 (1943); Hult., Fl. Al. and Yukon **5** : 815 (1945).

(Plate XV, figures 4–11)

So far, this plant is known only from the Arctic Coast of Yukon but undoubtedly will turn up elsewhere along the arctic foothills and on mountains of the interior.

Hulten, l.c., refers to this species a *Thlaspi* collected by Krause near Skagway, between Krotahini and Natagehin, Alaska, erroneously giving that place as the type locality. The type of *Thlaspi arcticum* came from Kay Point on the arctic coast of Yukon (Porsild, No. 7144).

Cochlearia officinalis L. ssp. **arctica** (Schlecht.) Hult.; Hult., Fl. Al. and Yukon **5** : 816 (1945).

C. officinalis var. *groenlandica* Ostf. Gjöa Exp. 48 (1910).

Common along the Arctic Coast. Shingle Point, Porsild, No. 7103.

Aphragmus Eschscholtzianus Andrz.; Porsild in Can. Field-Nat. **54** : 55 (1940); Hult., Fl. Al. and Yukon **5** : 819 (1945).

This very rare plant, otherwise known only from the Bering Sea region, was recently recorded from Yukon where it was collected at Lake Kluane by A. Müller (Porsild, l.c.).

Eutrema Edwardsii R. Br.; Hult., Fl. Al. and Yukon **5** : 819 (1945).

In Yukon collected a few times along the Arctic Coast and twice on mountains along the International Boundary. The species was common on calcareous limestone mountains on the east slope of Mackenzie Mountains along the Canol Road, N.W.T., and is probably common in the Ogilvie Mountains and in northwest Yukon.

Sinapis alba L., Sp. Pl. **1**: 668 (1753).

An introduced weed, collected in Dawson District, Gold Run Creek, Macoun, Can, No. 58365.

Sinapis arvensis L.; Hult., Fl. Al. and Yukon **5** : 825 (1945).

Quiet Lake, in a clearing by abandoned road camp, Mile 55, in beginning anthesis on July 4, No. 11127. An introduced weed, previously recorded from Dawson District.

Rorippa barbareaefolia (DC.) Kitagava in Journ. Jap. Bot. **13** : 137 (1937); Porsild in Rhod. **41** : 232 (1939).

R. hispida var. *barbareaefolia* Hult., Fl. Al. and Yukon **4** : 829 (1944).

Dawson District: Hunker Creek, Macoun, Can, No. 58378; Klondike Flats, idem, Can, No. 58377; Dawson, Malte, Nos. 34 and 34A.

In Yukon thus far collected only in Dawson District but known from numerous stations in central and western Alaska (Porsild, l.c.).

Rorippa islandica (Oed. ex Murr.) Borbās var. **microcarpa** (Regel) Fern., in Rhod. **42** : 271 (1940).

R. palustris and *R. palustris* vars. *Williamsii* and *hispida* sensu Hultén, Fl. Al. and Yukon **5** : 827-29 (1945), at least as regards Yukon plant.

R. Williamsii Britt. in Bull. N.Y. Bot. Gard. 2, **6** : 171 (1901).

Johnson Crossing, M. P. and R. T. Porsild, Nos. 304, 320, 422, 458, 461, 729, and 751; west bank of Nisutlin River, near Mile 36–42, No. 10812; Rose-Lapie Pass, in a meadow near Mile 102, No. 10622; lower Lapie Crossing, Mile 132, in rich poplar woods, No. 9577; same place, in springy places by bulldozer trail, No. 10036; same place, by a mooselick, No. 9427; Ross River valley, in wet meadow near north end of

Sheldon Lake, Nos. 11554 and 11555; in subalpine meadow near northeast spur of Mount Sheldon, Mile 226, No. 11476. Also, Mayo District, Anderson, No. 9686; ibid., Bostock, No. 64; Dawson, Macoun, Can, No. 58376; Malte, No. 35.

Common in wet meadows and in springy places in the lowland; in Lapie Pass ascending to 4,000 feet. The species varies greatly in regard to leaf shape, growth habit, and degree of pubescence. In freshly exposed soil a strong rosette is formed from which one to several erect and slightly branched flowering axes rise, whereas in wet places, among grasses, it tends to branch. Totally glabrous and moderately hispid plants may be seen growing side by side. The fruits, on the other hand, are remarkably uniform; the mature siliques average 2·5 mm. in width and 6 mm. in length; they are almost cylindrical, obtuse in both ends, on slender, divaricate or slightly reflexed pedicels, equalling or slightly longer than the siliques; the styles are prominent, about 1·0 mm. long. The species fruits abundantly from the end of June. Specimens with tetramerous siliques, or otherwise approaching the very distinct *R. barbareaefolia* (DC) Kitagava (*R. hispida* var. *barbareaefolia* Hult., l.c.) were not seen.

Thellungiella salsuginea (Pall.) O. E. Schulz, Pflanzenr. Crucif. Sisymb. 252 (1924).

Sisymbrium salsugineum Pall.

Arabidopsis glauca (Nutt.) Rydb.

Alaska Highway, on alkali flats near Haines Junction, No. 11950; Mile 945, Anderson and Brown, No. 10342.

A considerable extension of the known range of this prairie species which in the Northwest has recently been recorded from Wood Buffalo Park (Raup) and from the Arctic Coast east of Mackenzie (Porsild).

Barbarea orthoceras Ledeb.; Hult., Fl. Al. and Yukon **5** : 825 (1945).

Johnson Crossing, M. P. and R. T. Porsild, No. 755; east slope of Rose River valley, in springy places in pine and spruce bogs, near Mile 77, No. 10290; Rose-Lapie Pass, wet places in meadow, Mile 102, No. 10619; Ross River, north end of Sheldon Lake, Mile 222, No. 11553. Noted also on south fork of Macmillan River, Mile 250. Also Mayo District, Kalzas River, Bostock, No. 63.

A lowland species common to occasional on grassy river-banks and in wet, springy places. Number 11553 had mature fruits on August 1.

Cardamine bellidifolia L.; Hult., Fl. Al. and Yukon **5** : 832 (1945).

Pass between Teslin and Nisutlin Rivers on rocky summit east of Mile 10-14, 6,000 feet elevation, No. 10995; Rose River, granite mountain east of Mile 85-90, No. 10171; upper Rose River, gravelly river-flats opposite Mile 95, No. 10373; same place, steep west slope of granite range, No. 10507; same place, gravelly outwash plain, No. 10459; Mount Sheldon, rocky chimneys on south shoulder, elevation 5,600 feet, No. 11617. Also noted on the upper Macmillan River, Mile 268, and in Macmillan Pass, Mile 282. Also from Mayo District, McQuesten River, Christie, No. 44; Rupe Creek, Bostock, No. 66, and from southwest Yukon, Haines Road, Mile 85, Clarke, No. 515.

Apparently not uncommon on high mountains in southeast Yukon. In Yukon previously recorded only from the Arctic Coast.

Fruiting specimens were collected on Rose River on July 11.

Cardamine digitata Richards. in Franklin 1st. Journ. ed. 1. App. 743 (1823). *See* Porsild in Sargentia **4** : 41 (1943).

C. hyperborea Ostf. in Gjöa Exp. 48 (1909).

C. Richardsonii Hult., Fl. Al. and Yukon **5** : 838 (1945), pro max. pte.

In Yukon known from several collections from the Arctic Coast and from a single collection in the interior, Black River, latitude 66° 02′ N., longitude 141° W., Cairnes, Can, No. 83045.

Hultén, l.c., because of an alleged "earlier homonym," *Dentaria digitata* Lam., and because *Cardamine hyperborea* Schulz is a nomen confusum, has found it necessary to rename *C. digitata,* although on page 833 for *Cardamine Blaisdellii* Eastw., he rather inconsistently maintains *Cardamine microphylla* Adams, notwithstanding the earlier *Dentaria microphylla* Willd.

Cardamine pennsylvanica Muhl. apud Willd. Sp. Pl. **3** : 486 (1840).

Ross River valley, in marshy places on the west shore of Sheldon Lake near Mile 222, No. 11556.

Our specimens, which closely match material from Liard Hot Springs and elsewhere in the upper Mackenzie Basin, had flowers and mature fruits on August 16. The species is new to the flora of Yukon and in Alaska is known only from a single station in Kotzebue Sound (Porsild, Rhod. **41** : 234 (1939)).

Cardamine pratensis L.; Hult., Fl. Al. and Yukon **5** : 834 (1945).

Whitehorse, M. P. and R. T. Porsild, Nos. 73 and 107; Rose River in pine bogs near Mile 77, No. 10287; upper Rose River on river-flat near Mile 95, No. 10372; Rose-Lapie Pass, in a meadow near Mile 99, No. 11905; Pelly River valley, in wet, turfy soil by a lake near Mile 136, No. 9852. Also noted on Nisutlin River, Mile 42, on Mount Sheldon, on the south fork of Macmillan River at Mile 268, and in Macmillan Pass. Also from central western Yukon and from Haines Road, southwest Yukon, Clarke, No. 514.

A lowland species which, apparently, is not common in our area. The arctic var. *angustifolia* Hook. was not seen. Our No. 10372 had flowers and immature fruits on July 14.

Number 9852 belongs to a peculiar form in which the basal leaves and the lower part of the stems are conspicuously pilose (? f. *pilosa* G. Beck). This form was reported by the writer from Alaska (Rhod. **41**: 234 (1939)) but has not been seen by him from anywhere else, nor is it mentioned by Fernald, Rhod. **22** : 11-14 (1920). It may constitute a local race.

Cardamine purpurea Cham. & Schlecht.; Hult., Fl. Al. and Yukon **5** : 836 (1945).

In Yukon apparently restricted to mountains of the central and southwestern parts of the territory. Besides the stations given by Hultén, l.c., collected in Dawson Range, Canadian Creek, Bostock, Nos. 249 and 250, and in mountains south of Selkirk, Bostock, No. 24.

Cardamine umbellata Greene; Hult., Fl. Al. and Yukon **5** : 839 (1945).

Pass between Teslin and Nisutlin River, alpine meadow near Mile 10, No. 11138; Rose River, alpine slopes east of Mile 77, No. 10953; upper Rose River, alpine slope east of Mile 85-90, elevation 5,000 feet, No. 10170; alpine valley west of Mile 95, Nos. 10210, 10566, and 11931; grassy river-flat near Mile 95, Nos. 10374 and 10375; northeast shoulder of Mount Sheldon, elevation 5,000 feet, No. 11079; south fork of Macmillan River, Mile 240-250, No. 11427; upper south fork of Macmillan River, Mile 268, grassy slope above timber-line, 5,500 feet, No. 11351. Also noted in Macmillan Pass, Mile 282.

Although in the Yukon doubtfully recorded only from Lake Finlayson, *C. umbellata* is a common species in alpine meadows along the Canol Road where it flowers early and on Rose River had mature fruits on July 14. The present series is remarkably uniform.

Lesquerella arctica (Richards.) Wats. ssp. **Purshii** (Wats.) Porsild, stat. nov.

L. Purshii (Wats.) Fern. in Rhod. **35** : 267 (1933).

L. arctica Hult., Fl. Al. and Yukon **5** : 841 (1945), in part.

Rose-Lapie Pass, shaly slopes near summit of mountain east of Mile 105, elevation 6,000 feet, No. 10898; east slope of mountain west of Mile 118, steep sliderock at 5,500 feet, No. 10136; Lapie River crossing, dry, shaly slopes west of Mile 132, No. 9468. In Yukon previously known only from a single collection in mountains north of Black River.

In our area apparently limited to calcareous sliderock in the Pelly Range where it was always scarce. On Lapie River, flowers and almost fully mature fruits were collected on June 14.

Fernald, l.c., has shown that *Lesquerella arctica* and its ssp. *Purshii* [*L. Purshii* (Wats.) Fern.] constitute two well-defined geographical races. The range attributed to the former is: "Greenland and Arctic America, south to Rama (latitude 58° 43′) Labrador" and to the latter: "Western Newfoundland and Anticosti Island, Quebec." As in the case of a number of other species formerly considered endemics of Newfoundland and the Gulf of St. Lawrence, ssp. *Purshii* has recently been discovered to have its main range in the northern Cordillera where it was first recorded from northern British Columbia by Raup (Contr. Arnold Arb. **6** : 166 (1934)) and later, from central Alaska, by the present writer (Rhodora, **41** : 235 (1939)). Recent collections in the National Herbarium of Canada from Jasper Park, Alberta, northern British Columbia, Yukon, Northwest Territories, from the Arctic Coast near the Mackenzie Delta south to Nahanni River, and from central Alaska all clearly belong to the ssp. *Purshii*; whereas, according to Hultén, l.c., p. 841, specimens from Seward Peninsula in every respect agree with the plant of Greenland, as do specimens from the single Siberian station on lower Lena River (*Vesicaria leiocarpa* Busch). Although he admits that material from the interior of Alaska differs consistently by having pubescent pods, taller growth, and long slender pedicels and leaves, Hultén, nevertheless, considers these differences well within the permissible range of variation in an arctic plant.

Experiments reported by Rollins in Am. Journ. of Botany **26**, 6 : 419 (1939) on several species of *Lesquerella* show that the indument of sessile, stellate trichomes, so characteristic in this genus, persists in first generation plants grown under greenhouse conditions. In the field the writer has noted instances when the "frosted" appearance of the young siliques in ssp. *Purshii,* which is caused by these trichomes, may be lost later in the season due to mechanical abrasion of drifting sand when the plant grew on an exposed habitat, whereas in the same habitat the siliques of plants sheltered against the wind retained their indument.

In the light of Rollins' studies and the much larger material now on hand of western ssp. *Purshii,* but particularly in view of its well-defined geographical range, there can be little doubt that it constitutes a good geographical race.

Capsella Bursa-pastoris (L.) Medic. Pfl. Gatt. **1**: 85 (1792).

Johnson Crossing, Mile 0, tall fruiting specimens on July 20, M. P. and R. T. Porsild, No. 559, where it was a recently introduced weed. Also at Dawson, August 12, 1916, Malte (Can).

Neslia paniculata (L.) Desv.; Hult., Fl. Al. and Yukon **5** : 843 (1945).

An introduced weed, collected once in Dawson district.

DRABA

Generally speaking, the genus *Draba* is poorly represented in southeast Yukon, particularly when compared with more southerly parts of the Cordillera. Even the basic rocks of Pelly Range harbour a surprisingly poor *Draba* flora. *Draba aurea, Dr. praealta,* and *Dr. luteola* in our area are lowland species but are rare or occasional. The rest are predominantly alpine species, but all, except *Dr. longipes,* which is seldom absent in snowflush vegetation above timber-line, are surprisingly rare and sporadic in their occurrence.

Draba aurea M. Vahl; Hult., Fl. Al. and Yukon **5** : 847 (1945).

Upper Rose River in an old burn east of Mile 95, No. 10458; Rose-Lapie River pass, dry, grassy slope near Mile 102, Nos. 9356 and 10618; dry, shaly slopes west of Lapie River crossing, Mile 132, No. 9719. Also from Dawson Range, latitude 62° 40′ N., longitude 138° W., Bostock, No. 253; Haines Road near boundary, M. P. and R. T. Porsild, No. 192, and Kluane Lake, Clarke, No. 164.

Draba aurea apparently is not common in the interior of Yukon where, previously, it has been recorded from Whitehorse and Kluane Lake. On Rose River our specimens had flowers and almost mature fruits on July 17.

Draba borealis DC., Syst. Nat. **2** : 342 (1821).

Haines Road near boundary, M. P. and R. T. Porsild, No. 193.

A considerable extension of the known range of this species which in North America was previously known from the west Pacific Coast and Bering Sea region.

Draba cinerea Adams; Hult., Fl. Al. and Yukon **5** : 850 (1945).

Rose-Lapie River pass, very scarce on outwash plain near Mile 102, elevation 3,600 feet, No. 10617; Mount Sheldon, rocky ledges at 5,000 feet, opposite Mile 222, No. 11771.

An arctic species which apparently is very rare in the interior of Yukon where it is restricted to high mountains. Previously recorded only from the Arctic Coast (Ostenf.). Our specimens were in fruit on July 19.

Draba crassifolia Grah. in Edinb. New Phil. Journ. 182 (1829).

Rose-Lapie River pass, rare on moist grassy slope (snowflushes) near Mile 102, No. 9360; alpine slopes of schist mountain east of Mile 105, elevation 5,000 feet, No. 10906. Also from Mayo District, latitude 63° N., longitude 136° W., Bostock, No. 211, and from Haines Road near boundary, M. P. and R. T. Porsild, No. 246b.

Apparently a rare alpine, or perhaps sometimes overlooked, species not previously recorded from Yukon, and seen by us at no other stations. Flowering specimens were collected on June 11 and fruiting ones on July 21.

Draba Eschscholtzii Pohle.; Hult., Fl. Al. and Yukon **5** : 851 (1945).

Rose-Lapie River pass, gravelly summit of mountain east of Mile 105, elevation 6,000 feet, Nos. 10903 and 10905.

Flowering and fruiting specimens were collected on July 21 near a snowpatch.

Our plant is loosely caespitose and scapose; the leaves are pubescent on both sides with forked hairs, and sparsely ciliate along the margins. The petals are pale yellow during anthesis but soon become white; the siliques are broadest below the middle with a very conspicuous 1·0 mm. long style; the valves are pubescent with soft, branching hairs.

Our plant is no doubt related to *D. alpina* but differs from that species by its less densely caespitose habit and by the absence of masses of dead, marcescent leaves below the living foliage and by the shape of the silique and longer style. Following Hultén, l.c., our plant is tentatively referred to the Asiatic *Dr. Eschscholtzii* reported by him from two stations in Alaska and from Lake Bennett, Yukon. It is rare in our area where, together with *C. macrocarpa*, it appears to be the only representative of the group.

Draba glabella Pursh; *See* Fernald, in Rhod. **36** : 339 (1934).

Dr. daurica DC.

Dr. hirta sensu Hult., Fl. Al. and Yukon **5** : 853 (1945).

Upper Rose River near Mile 95 in an old burn, No. 10456; Rose-Lapie River pass, dry, grassy slope near Mile 102, No. 10616; southwest slope of granite mountain west of Mile 116, elevation 4,000 feet, No. 10064; Pelly River valley, Mile 136, in mossy places under willows, No. 9853; upper south fork of Macmillan River, gravel outwash plain near Mile 280, No. 11307. Also noted on Mount Sheldon on rocky ledges above timberline. Also from Lake Bennett, Malte, No. 32; and Alaska Highway, Macintosh, Anderson and Brown, No. 10044. In Yukon previously recorded from Dawson and from the Arctic Coast.

Numbers 9853 and 10456 represent a curious form with long pedicels and may represent a hybrid with *Dr. longipes* Raup. Similar forms were collected by the writer on the Arctic Coast west of Mackenzie Delta, Porsild, Nos. 6906 and 7105 (compare Hultén, l.c., 854).

Our specimens all differ from typical *Dr. glabella* by the presence of a thin pubescence on the siliques of simple or forked hairs. Number 9853 had mature fruits on June 23.

Draba lactea Adams in Mém. Soc. Nat. Mosc. **5** : 104 (1817).

Lower Lapie River crossing, grassy summit of mountain south of Mile 132, Nos. 9597, 9615, 9930, and 15206; Mount Sheldon, steep ravines and ledges opposite Mile 222, elevation 5,000 feet, No. 11770.

An arctic species, which in our area is limited to high mountains where it was very scarce. On Lapie River the species flowered on June 15 and on Mount Sheldon fruited on August 17.

Our No. 15206 differs from the rest of the series by its narrow leaves which are glabrous above but have long, simple hairs on the underside as well as on the single leaf of the otherwise leafless and glabrous flowering stem and on the sepals as well. The petals are white, and the young siliques glabrous with a 0·75 mm. long style. The single specimen grew near typical *Dr. lactea.* Apparently new to the flora of Yukon.

Draba lanceolata Royle; Hult., Fl. Al. and Yukon **5** : 857 (1945).

Whitehorse, Anderson, No. 9325; Rose-Lapie River pass, sandy hillside near Mile 102, Nos. 9359 and 15204; grassy slope near timber-line of schist mountain east of Mile 105, elevation 6,000 feet, Nos. 9371 and 9395; same place, shaly cliff by a waterfall, No. 10902 (*lanceolata* x ? *praealta*); alpine slope of mountain west of Mile 116, elevation 6,000 feet, No. 10063; Lapie River crossing, dry, shaly slopes of mountains west of Mile 132, No. 9721; grassy summit of mountains south of road, No. 9932. Also Haines Road, Mile 85, Clarke, No. 518; Kluane Lake, idem, No. 165. Also recorded from Dawson.

Occasional to rare on dry, shaly, calcareous slopes in the Pelly Range but not noted by us elsewhere. Our specimens flowered early in June and on July 19 had mature fruits.

Draba lonchocarpa Rydb. in Mem. N.Y. Bot. Gard. **1**: 181 (1900).

Dr. nivalis var. *elongata* Wats. in Proc. Am. Acad. **23** : 258 (1888).

?*Dr. nivalis* var. *glabrescens* Hult., Fl. Al. and Yukon **5** : 862 (1945), at least in part.

Rose-Lapie Pass, rocky chimneys of granite mountain east of Mile 118, elevation 5,500 feet, No. 10137. Flowering specimens with young fruits on June 29.

Because of alleged intermediate forms between *Dr. lonchocarpa* and typical *Dr. nivalis*, Hitchcock, in Univ. Wash. Publ. in Biol. **11**: 84 (1941), finds that he cannot consider the former above varietal rank (*Dr. nivalis* var. *elongata* Wats.). O. E. Schulz, on the other hand, in Engler: Pflanzenr. IV: **105** : 215 (1927), considers *Dr. lonchocarpa* a good species and cites specimens from southeast Alaska: Muir Glacier and Virgin Bay, Trelease and Saunders, Nos. 3911 and 3913.

In the light of much field experience with both *Dr. nivalis* and *Dr. lonchocarpa*, the writer feels that the latter is a perfectly good and distinct Cordilleran species which barely enters Yukon and Alaska. Where the range of the two species overlap, intermediate forms do occur but are never common. Inasmuch as hybridization is known to occur in the genus, these intermediate forms may possibly be hybrids. *Dr. lonchocarpa* may be distinguished from *Dr. nivalis* by its usually stalked trichomes and long, simple, or rarely forked hairs along the margins of the basal leaves; by its glabrous scapes and pedicels, the latter even in anthesis much longer than in *Dr. nivalis*; and by its longer siliques, seven to fifteen times as long as broad.

Draba lonchocarpa is new to the flora of Yukon; besides the Alaska specimens cited above, it has been collected in the St. Elias Range, Alaska, Laing, No. 88 (Can).

Draba longipes Raup in Contr. Arn. Arb. **6** : 165, pl. 6, 2 (1934).

Granite mountain range west of upper Rose River, Mile 95, alpine slopes and ravines, elevation 6,000 feet, No. 11932; same place, flowering specimens from edge of snowflush, No. 10211; steep west slope of granite range east of Mile 95, elevation 6,000 feet, Nos. 10505 and 10508; Rose-Lapie Pass, near snowflushes at Mile 102, No. 9357; schist mountains east of Lapie Lake, Mile 105, in a canyon above timber-line, 6,000 feet, Nos. 10900 and 10904; Macmillan Pass, alpine, treeless country, Nos. 11236 and 11237; also observed on Mount Sheldon.

In our area *Dr. longipes* perhaps is the most common member of the genus; it commonly grows near or above timber-line, often near snowflushes or in wet moss by alpine brooks and in herbmats, where it is frequently associated with *Dr. crassifolia.* On Rose River it ascends to 6,000 feet. The flowers are creamy white or pale yellow. Plants having entire leaves are more common than those with dentate ones. The known range of *Dr. longipes* has recently been extended north through Mackenzie Mountains to the Arctic Coast and through mountains of central Yukon and Alaska to Bering Strait. New to the flora of Yukon.

Draba luteola Greene in Pitt. **4** : 19 (1899).

?*Dr. maxima* Hult., Fl. Al. and Yukon **5** : 859, fig. 2 (1945). *See* also, Porsild in Sargentia **4** : 42 (1943).

Rose-Lapie River pass, grassy slope near snowflush at Mile 102, elevation 3,600 feet, No. 9358; in alpine meadow on outwash plain at Mile 112, No. 9802; Pelly River valley, in peaty soil near a bulldozer trail south of Mile 136, No. 9780.

Our specimens are a perfect match for a plant reported from Great Bear Lake and Coronation Gulf, N.W.T., and from the Peace River (Porsild, l.c.) and probably is the *Dr. maxima* recently described from Alaska by Hultén, l.c. Two collections from the Alaska Range, Paxon: A. E. and R. T. Porsild, Nos. 546 and 577, reported as *Dr. glabella* (Rhod. **41**: 236 (1939)) also belong here.

Draba luteola Greene, by Schulz, l.c., 177, was reduced to a variety of *Dr. aurea*, whereas Hitchcock, l.c., 26, without comment lists it as a straight synonym of that species. The late Mrs. Ekman considered the Bear Lake plant *D. aurea* x *daurica* [*glabella*] and "probably also *D. arabisans* Michx." The latter proposition, as shown by Fernald, Rhod. **36** : 251-254 (1934), was a rather unfortunate guess.

Our plant is probably not even closely related to *Dr. aurea* and is certainly not a hybrid. Our specimens flowered in early June and on June 21 had almost mature fruits.

General range: From Colorado and Utah north through the Canadian Rockies east to Great Bear Lake, west through northern British Columbia and Yukon to Alaska.

Draba macrocarpa Adams in Nouv. Mém. Soc. Nat. Mosc. **3** : 349 (1834).

North side of Ladue River, latitude 63° 58′ N., longitude 134° 30′ W., elevation 5,500 feet, Bostock, No. 67.

The specimens are in flower and are tentatively referred to this species which, by Hultén, l.c., 858, has been reported from northwestern Alaska.

Draba nemorosa L.; Hult., Fl. Al. and Yukon **5** : 861 (1945).

Haines Road, near boundary, M. P. and R. T. Porsild, Nos. 191b, 194, and 195.

In Yukon previously recorded from Yukon Valley.

Draba nitida Greene in Pl. Baker **3**, 1 : 7 (1901).

(Plate XV, figures 1–3)

Dr. ? *Sornborgeri* Fern. in Rhod. **36** : 319, tab. 300, figs. 1-3 (1934).

Rose River valley in a flood-plain meadow near Mile 77, elevation 3,000 feet, July 3, No. 10291; rich subalpine meadows on northeast spur of Mount Sheldon near Mile 226-7, elevation 3,400 feet, August 8, No. 11475.

Both collections were of the fruiting plants. Cultures started from seed of No. 11475, in October, 1947, produced sterile rosettes the following summer that all flowered early in 1949 and died after maturing seed.

Biennial; stems simple or freely branching from the base, 20 to 30 cm. high, bearing 3 to 7 leaves, in youth hirsute below with simple and forked hairs, glabrous and somewhat shiny above. Basal leaves lanceolate, short petiolate, entire, 2 to 3 cm. long, 6 to 8 mm. broad, glabrous above and with scattered simple and forked hairs on the underside and along the margins. Inflorescence racemose, 20- to 30-flowered, rapidly elongating, peduncles even in anthesis 5 to 8 mm. long, spreading or ascending. Flowers small; sepals yellowish green, somewhat fleshy with a few, simple trichomes; petals pale yellow in life, drying deep yellow, 2 to 3 mm. long, narrowly cuneate, slightly emarginate. Mature siliques 3 to 10 mm. long, the largest about 2 mm. wide, lanceolate, distinctly broadest below the middle, erect or spreading, in length equalling their peduncles; styles very short or obsolete; valves glabrous, each compartment containing 12 to 20 seeds.

Our plant rather closely matches *Dr. nitida* Greene, of which the writer has examined authentic material in the Gray Herbarium, including a duplicate of the type: Marshall Pass, July 19, 1901, 10,000 feet, Baker, No. 492, besides three sheets in the National Herbarium, Ottawa, from Banff Park, Alta., collected by J. Macoun (Can, Nos. 64487, 64491, and 100777). Schulz, Pflanzenr. IV, 105, accepted *Dr. nitida* Greene but separated the Canadian plant as *Dr. nitida* var. *nana* Schulz, l.c., 320, whereas Hitchcock, Univ. Wash. Publ. Biol. **11** : 99-101 (1941) transferred both to *Dr. stenoloba* var. *nana* (Schulz) Hitch.

Rydberg in Flora of Rocky Mountains, as synonym for *Dr. nitida* Greene, gives *Dr. stenoloba* Wats., not Ledeb., thereby showing that in his opinion true *Dr. stenoloba* does not occur in the area covered by his manual. With this view the writer is in close agreement, for the plant of Alaska and Yukon that closely matches duplicates of the type of *Dr. stenoloba* (1) "Dr. hirta δ siliquosa Hb. Cham. Herb. Acad. Petrop. Unalaschka. Chamisso in itin." and (2) "Dr. stenoloba Led. Unalaska. Eschscholtz" (both in Gray Herbarium) is a very different plant with more or less scapose flowering stems, basal leaves densely hirsute with 4- to 5-forked hairs, glabrous, linear, curved and twisted siliques on strongly curved peduncles, and milky white petals which in drying almost invariably turn rose or pink.

Draba nitida Greene was described as being annual but almost certainly is biennial like ours which, even when grown at Ottawa, required two years to flower and reproduce seed. Greene's plant differs consistently from ours in having linear siliques, whereas ours are distinctly broader below the middle. Also, the petals, at least in the duplicate type at Gray Herbarium, are distinctly rose-pink, whereas ours are decidedly yellow.

Our plant also very closely matches the description and the plate of *Dr. Sornborgeri* Fernald, Rhod. **36** : 319, tab. 300, figs. 1-3 (1934), the type of which is J. D. Sornborger, No. 61 (G) from Ramah in northern Labrador and, as far as the writer is aware, not collected elsewhere.

Draba Sornborgeri is described as perennial, but the root shown in Fernald's excellent plate is very spindly and may well be biennial. Dr. Reed C. Rollins, Director of the Gray Herbarium, who very kindly compared our Yukon material with the type of *Dr. Sornborgeri*, confirms the close agreement "except for the hirsuteness of the lower stem and leaves" [in ours], remarking that the fact that the type of *Dr. Sornborgeri* is a more mature plant may account for the lack of hairs on the lower part of stem.

In southeastern Yukon *Dr. nitida* belongs in that small group of plants which is peculiar to the relic grassland where it was very common locally.

The known range of *Dr. nitida* is Southern Colorado and Sierra Nevada of California to mountains of southern Alberta and British Columbia, to which should be added isolated stations in southeastern Yukon and northern Labrador.

Draba nivalis Liljebl.; Hult., Fl. Al. and Yukon **5** : 862 (1945).

Upper Rose River valley, rock ledges in a ravine near Mile 95, No. 10457; lower Lapie River, grassy summit of mountain south of Mile 132, elevation 6,000 feet, Nos. 9616 and 9931; Mount Sheldon, northeast shoulder, rocky ridges near timber-line, No. 11078. Also from Dawson Range, latitude 62° 35′ N., longitude 138° 20′ W., Bostock, No. 252; Haines Road, Mile 85, Clarke, No. 517.

An arctic-alpine species, rare in our area, where it is restricted to high mountains. On Lapie River flowering specimens were noted on June 15 and fully mature fruits on June 26. For a comparison with *Dr. lonchocarpa*, see that species.

Draba oligosperma Hook., Fl. Bor.-Am. **1** : 51 (1830); Hult., Fl. Al. and Yukon, **5** : 863 (1945), in part.

Whitehorse, dry hillsides north of Lewes River, Nos. 10670 and 10671; shaly mountain west of Lapie Crossing, Mile 132, in sliderock, elevation

5,000 feet, No. 9470. Also Alaska Highway, Mile 1022, Anderson and Brown, No. 10017.

Apparently a rare and local species collected only twice before in the Yukon, at Lake Bennett and on Stewart River.

Under this species Hultén, l.c., cites two collections from St. Elias Range (Laing, Nos. 79 and 80) which by the writer, in Rhodora **41** : 236 (1939), were reported as *Dr. incerta* Payson. The latter species may be related to *Dr. oligosperma* but as recently shown by Hitchcock, Univ. Wash. Publ. **11** : 74-78, tab. 6, figs. 44 and 48 (1941), is abundantly distinct. A comparison with recent large series collected in the Canadian Rockies by the writer affirms that his report of *Dr. incerta* from Alaska was correct.

Draba pilosa Adams; Hult., Fl. Al. and Yukon **5** : 863 (1945).

In Yukon known from a single collection from Herschel Island on the Arctic Coast. It may be present also elsewhere in northwest Yukon.

Draba praealta Greene in Pitt. **3** : 306 (1898).

Dr. hirta Hult., Fl. Al. and Yukon **5** : 853-55 (1945), pro min. pte.

Yukon: Whitehorse Rapids, Tarleton, No. 37 (US); Ramparts House, Fr. Funston, No. 176 (G), a duplicate collection in Stockholm is cited by Hultén, l.c., as *Dr. hirta*; Rose-Lapie River pass, sandy slopes near Mile 102, No. 15205; grassy slope east of Lapie Lake, Mile 105, No. 9249; lower Lapie River crossing, dry, shaly slopes of mountain west of Mile 132, No. 9720. Alaska: McKinley National Park, E. Scamman, Nos. 214 and part of 622 (G).

The status of this well-defined species, which has been generally ignored or misunderstood by most students of western *Draba*, has recently been clarified by Hitchcock in Univ. Wash. Publ. in Biol. **11** : 97-98, fig. 29 (1941) who gives its range as "wooded regions of the Rocky Mountains west to California and Oregon, north to Alberta and British Columbia." To this should be added: North to Mackenzie Mountains, Raup, Sargentia **6** : 183 (1947), Great Bear Lake, Porsild, Sargentia **4** : 43 (1943), and southern Yukon and central Alaska.

Draba praealta is common on dry, calcareous slopes in the Canadian Rockies where the writer has collected it on the type locality: east of Spray River, Banff (the type is John Macoun, Can, No. 1998a). *Dr. praealta* is probably always biennial; thus in the Canadian Rockies fruiting specimens have been noted in mid-June, and in the Yukon our specimens flowered on June 10 and on July 19 had mature fruits. In life the petals at first are a very pale yellow but soon bleach to white. The flowering axis, which is greatly elongated in the postflowering period, is simple or slightly branched, strict and very erect, bearing rarely more than two leaves below the inflorescence. The pedicels are ascending, equalling or slightly shorter than the erect siliques. The pubescence of the latter is composed of simple or 2- to 3-forked, soft trichomes, not at all like the cinereous stellate pubescence of *Dr. lanceolata* with which *Dr. praealta* is sometimes confused.

Draba stenoloba Ledeb., Fl. Ross. **1**: 154 (1841).

Upper Rose River, steep west slope of granite range east of Mile 95, No. 15202; alpine slopes above timber-line west of Mile 95, No. 10212;

south shoulder of Mount Sheldon, in a ravine near timber-line, elevation 4,500 feet, No. 11616.

An alpine, and apparently rare, species seen nowhere else. In life the petals are pale yellow but in drying often show a tinge of pale purple. On Mount Sheldon fruiting and flowering specimens were collected on August 7. New to the flora of Yukon but known from adjacent parts of Alaska.

Smelowskia calycina (Steph.) C. A. Mey. in Ledeb. Fl. Alt. **3** : 170 (1831).

This species was recently recorded from mountains west of Mackenzie Delta (Porsild, Sargentia **4** : 43 (1943)) and probably occurs in the Ogilvie Mountains and in northwestern Yukon.

In western Alaska is found a race with entire or subentire leaves, ssp. *integrifolia* (Seemann) Hult.

Sisymbrium altissimum L., Sp. Pl. 659 (1753).

An introduced weed which, in Yukon, has been collected at Dawson, Malte, No. 301.

Descurainia Richardsonii (Sweet) O. E. Schulz; Hult., Fl. Al. and Yukon **5** : 821 (1945).

Whitehorse, river-banks near the shipyard, No. 9180; Johnson Crossing, M. P. and R. T. Porsild, No. 425; Rose River valley in a pine bog near Mile 77, No. 10288; Pelly River valley, on a burnt-over hillside near Mile 136, No. 9645; near Ross River trading-post, No. 9692. Also from Dawson District, Eastwood, No. 435, and Lake Kluane, Anderson, No. 9518.

Descurainia Richardsonii is a common species on river-banks and in clearings; in the lowland it was rapidly becoming established along roadside clearings and on embankments. It flowers in June and on July 3 had fully mature fruits.

Descurainia Sophia (L.) Webb ex Prantl in Engl. & Prantl, Nat. Pflanzenf. **3**, 2 : 192 (1890).

Whitehorse, dry river-banks along Lewes River, No. 9179. Flowering specimens with young fruits on June 7. Not seen elsewhere by us but collected at Mayo by Anderson, No. 9696, and at Dawson by Malte, No. 302. An introduced species not previously recorded from Yukon.

Descurainia sophioides (Fisch.) O. E. Schulz; Hult., Fl. Al. and Yukon **5** : 822 (1945).

This species has been collected a number of times in Yukon Valley and on the arctic coast of Yukon. We did not see it along the Canol Road, but it has been collected at Mayo, Anderson, No. 9685.

Arabis divaricarpa A. Nelson; Hult., Fl. Al. and Yukon **5** : 871 (1945).

West bank of Nisutlin River, on dry slopes near Mile 36, No. 10810; lower Lapie River crossing, on dry, shaly slopes west of Mile 132, No. 9471; same place, near timber-line, elevation 5,000 feet, No. 9722.

Apparently rare and occasional; in our area restricted to calcareous, dry, shaly slopes and river-banks. At Lapie River the species was in fruit on the lower slopes on June 14, while at 5,000 feet it was still in anthesis a week later. In Yukon previously recorded from Yukon Valley.

Arabis Drummondii A. Gray in Proc. Am. Acad. **6** : 187 (1866).

Whitehorse, Anderson, No. 9572, Rose River valley, dry slopes near Mile 77, No. 10286; upper Rose River, gravelly river bars near Mile 95, No. 10539; Rose-Lapie Pass, grassy slope near Mile 102, Nos. 9355 and

10620; subalpine meadow near Mile 115, No. 9803; Mount Sheldon, in subalpine meadows near Mile 226, No. 11477. Also Haines Road near boundary, M. P. and R. T. Porsild, No. 189.

Common to occasional in subalpine meadows in Pelly Range but north of there seen only once, at Mount Sheldon. In Rose-Lapie Pass the species flowered on June 11 and had almost mature fruits on July 19. Our specimens are totally glabrous or, at most, with a few hairs on the leaf petioles. The species is new to the flora of Yukon but is known from Lake Atlin in northern British Columbia.

Arabis hirsuta (L.) Scop. ssp. **pycnocarpa** (Hopkins) Hult.; Hult., Fl. Al. and Yukon **5** : 873 (1945).

Whitehorse, M. P. and R. T. Porsild, No. 31; Johnson Crossing, idem, No. 752; lower Lapie River crossing, in rich poplar wood by a bulldozer trail near Mile 132, No. 9834. Not seen elsewhere along the Canol Road; apparently common along Yukon Valley. Our specimens flowered on June 22.

Arabis Holboellii Hornem. var. **retrofracta** (Grah.) Rydb.; Hult., Fl. Al. and Yukon **5** : 874 (1945).

Whitehorse, common on shaly banks of Lewes River, No. 9176; Johnson Crossing, M. P. and R. T. Porsild, No. 406; Rose-Lapie Pass, grassy slopes near Mile 102, No. 10621.

Apparently a rare species along Canol Road but collected in a number of places in Yukon Valley and in southwest Yukon. It flowered at Whitehorse on June 1 and in the Rose-Lapie Pass had mature fruits on July 19. The writer has seen no typical *A. Holboellii* from Yukon.

Arabis Hookeri Lange, Consp. Fl. Groenl. 50 (1880); Fl. Dan. Tab. 2296. *See* Porsild in Sargentia **4** : 43 (1943).

Arabidopsis mollis Hult., Fl. Al. and Yukon **5** : 870 (1945).

Pelly River, common by roadsides in Indian village near Ross trading-post, No. 9693; flowering and fruiting specimens on June 16. In Yukon known also from a number of stations in Yukon Valley.

Arabis lyrata L. ssp. **kamchatica** (Fisch.) Hult.; Hult., Fl. Al. and Yukon **5** : 875 (1945).

Whitehorse, Miles Canyon, M. P. and R. T. Porsild, No. 70; Johnson Crossing, idem, No. 303; upper Rose River, gravelly flood-plain near Mile 95, Nos. 10376 and 10377; south fork of Macmillan River, Mile 250, No. 15207; same place, No. 11426; upper south fork of Macmillan River, Mile 268, in alpine meadow near a snowflush, elevation 5,000 feet, No. 11350. Also noted on Mount Sheldon in ravines on the southeast slope, on Sheldon Lake and in Macmillan Pass, Mile 282. Also from Dawson Range, latitude 62° 40′, longitude 138°, Bostock, No. 255; Haines Road, near boundary, M. P. and R. T. Porsild, Nos. 190, 191a, and 249, and from several stations in Yukon Valley.

A common species on gravelly river-flats and flood-plains which occasionally ascends to timber-line. Specimens on Rose River had mature fruits on July 14. The species is readily propagated vegetatively by axillary buds that develop into leaf rosettes when the stem is buried during spring floods. Number 15207 is such a form but is probably caused by grazing. It has a much branched stem with vigorous leaf rosettes from the axils of the cauline leaves and below the inflorescence.

Arabis Nuttallii Robinson in Gray Syn. Fl. N. Am. **1**: 160 (1895).

Whitehorse, No. 9175.

Two flowering specimens, undoubtedly of this species, were collected on June 7 on the river-bank within the town limits. The species is otherwise known in Canada from two single collections, from Crowsnest Pass and Porcupine Hills, both in southern Alberta (Can), and its unexpected occurrence at Whitehorse is undoubtedly due to recent introduction.

Erysimum angustatum Rydb. in Bull. N.Y. Bot. Gard. **2** : 171 (1901) Hult., Fl. Al. and Yukon **5** : 883 (1945).

Thus far this species is known only from a few collections from Dawson District.

Erysimum cheiranthoides L.; Hult., Fl. Al. and Yukon **5** : 884 (1945).

Alluvial flats west of Nisutlin River, near Mile 36-42, No. 10811; Rose River, in flood-plain meadow near Mile 77, No. 10289; Pelly River, river-banks near Ross River trading-post, No. 9691. Also from Alaska Highway, Mile 945, Anderson and Brown, No. 10341. In Yukon otherwise known from Dawson District only.

The species was seen at no other station in our area and apparently is restricted to lowland stations. It flowered on Rose River on July 3 and on the Nisutlin had mature fruits on July 23.

Erysimum inconspicuum (S. Wats.) MacMill.; Hult., Fl. Al. and Yukon **5** : 885 (1945).

Two strikingly different forms of this plant occur in our area. One grows on dry, calcareous slopes, the other in open, dry spruce woods. The first is stiffly erect, with very narrow (2 to 3 mm. wide) linear-oblanceolate basal and cauline leaves which, like the strongly angled stem, are cinereous with very stiff, adpressed hairs. The outside of the petals have a few forked trichomes arranged in a median line. Superficially this plant resembles *E. angustatum*; but the petals are only half as long as in that species, and the siliques are beakless. The following series belongs here:

Lower Lapie crossing, dry, shaly lower slopes of mountain west of Mile 132, Nos. 9439 and 9469; lower Ross River, dry clay terraces, Mile 150, No. 9700. Also from north fork of Klondike River, Cockfield, No. 25; Alaska Highway, Haines Junction, Clarke, No. 328.

In the other form the leaves are broader, 6 to 8 mm. wide, and, like the stem, so sparingly covered by adpressed hairs that the plant appears green; the petals are totally glabrous. This may be *E. coarctatum* Fern., Rhod. **29** : 141 (1927). The following specimens belong in this series:

Whitehorse, open pine-covered river-bank east of Lewes River, No. 9178; same place, near airport, M. P. and R. T. Porsild, No. 48; Pelly River valley, open spruce forest near Mile 136, No. 9665. Also from Dawson, Malte, No. 29.

Both forms are found throughout the range of *E. inconspicuum*, and the writer has before him material from Alaska, Mackenzie Basin, Canadian Rockies, and foothills of Alberta.

Our specimens flowered in early June.

Erysimum Pallasii (Pursh) Fernald; Hult., Fl. Al. and Yukon **5** : 885 (1945).

In the Yukon thus far recorded only a few times from the Arctic Coast but undoubtedly found also in mountains of northwestern Yukon.

Alyssum americanum Greene; Hult., Fl. Al. and Yukon **5** : 886 (1945).

In addition to the Yukon stations given by Hultén, l.c., there are in the National Herbarium of Canada two recent collections from Yukon that extend the known range of this very rare plant farther east: Sixtymile River, May 28, 1939, R. T. Porsild (flowering specimens), and McArthur Mountain, at the Hot Springs, Bostock, No. 169.

We did not see this species, although we searched for it assiduously on the calcareous screes of the Pelly and Mackenzie Mountains.

Braya humilis (C. A. Mey.) Robinson in Gray Syn., Fl. N. Am. **1** : 141 (1895).

Torularia humilis Hult., Fl. Al. and Yukon **5** : 889 (1945).

Rose-Lapie Pass, shale cliffs of mountain east of Lapie Lake, Mile 105, elevation 6,000 feet, No. 10899; cliffs above timber-line of mountain west of Mile 116, No. 10062; rocky chimneys and screes of mountain west of Mile 118, No. 10138. Also from Kluane Lake, M. P. and R. T. Porsild, No. 13, and previously recorded from Yukon Valley.

Braya humilis apparently is rare and isolated along the Canol Road where it was collected only in three stations, all in the Pelly Range, and where it behaved as an arctic-alpine species. Elsewhere within its range *Braya humilis* is generally a lowland species which normally grows on river-banks and on flood-plains. Our specimens had flowers and almost mature fruits on July 1.

Parrya nudicaulis (L.) Regel in Bull. Mosc. **34**, 2 : 176 (1861).

P. nudicaulis ssp. *interior* Hult., in Fl. Al. and Yukon **5** : 890 (1945).

Rose-Lapie Pass, alpine herbmats on mountain east of Mile 105, elevation 6,000 feet, Nos. 9396 and 10907; lower Lapie Crossing, grassy summit of mountain south of Mile 132, elevation 5,600 feet, Nos. 9419, 9420, 9613, and 9614; moist alpine heath on summit of mountain west of Mile 132, No. 9723. Also from Mayo District, Edwards Creek, Bostock, No. 65; McQuesten River, Christie, Nos. 45, 46, and 47; Dawson Range, latitude 62° 35′, longitude 138° 20′, Bostock, Nos. 25 and 254; Kluane Lake, Burwash Landing, 6,000 to 7,000 feet, Clarke, No. 239; also a number of places in the Dawson District and from the Arctic Coast. A single collection from northern British Columbia is in the National Herbarium, Ottawa (Father Mountain, northern B.C., July 3, 1898, J. B. Tyrrell, Can, No. 19433).

The species is very variable; so much so that within a single colony the writer has seen specimens with leaves varying from coarsely dentate to entire, totally glabrous pedicels to densely hirsute ones, and flowers varying in diameter from 1·5 to 3·3 cm., some pure white, some lilac, and some dark purple. Even the fragrance of the flowers vary from plant to plant; some are strongly scented; others are quite odourless. Hultén, l.c., considers the plant of interior Alaska and Yukon a geographical race, ssp. *interior* Hultén, of which he recognizes a large-flowered var. *grandiflora* Hultén. The ssp. *interior* he distinguishes from the species by its entire or subentire leaves, filaments that are dilated near the base, narrow siliques, and longer styles. It should be noted that several numbers in the above series can scarcely be distinguished from the plant of the Bering Sea region, although others are indistinguishable from specimens in the National Herbarium of Canada from Nova Zembla and the Ural Mountains.

Parrya nudicaulis is common on high mountains of Pelly Range but was seen nowhere else along the Canol Road until we reached the Palæozoic rocks of the east slope of Mackenzie Mountains (N.W.T.). In the Lapie Pass the species flowered on June 11 and had matured fruits on July 21.

Melanidion boreale Greene in Ottawa Nat. **25** : 146 (1912); Hult., in Bot. Not., p. 170-1, fig. 1, 1940; Porsild, Bull. Nat. Mus., Canada, **101** : 21 (1945).

Ermania borealis Hult., in Fl. Al. and Yukon **5** : 878 (1945), fig. 3-4.

This curious plant was described from fragmentary specimens collected by D. D. Cairnes in 1911 along the Alaska-Yukon boundary near Runt Creek, in latitude 66° 18′ N. In recent years *Melanidion* has been discovered also in Mount McKinley National Park and in the Mackenzie Mountains, along the Canol Road east of the Yukon-N.W.T. boundary (Porsild, l.c.). It will, undoubtedly, turn up also elsewhere in northwest Yukon and in Alaska.

DROSERACEAE

Drosera anglica Huds., Fl. Angl. ed. **2** : 135 (1778).

Northeast spur of Mount Sheldon, in a bog near Mile 226, No. 11479.

Our specimens grew with *Scirpus caespitosus, Carex paupercula, Oxycoccus microcarpus, Menyanthes trifoliata, Kalmia polifolia,* etc. on the floating surface of quagmire and were past flowering and with immature fruits on August 4. The species was not seen anywhere else in our area.

The present collection, which is the first made in the Yukon, fills a gap between southern Alaska and Great Bear Lake.

Drosera intermedia Hayne in Schrad. Journ. Bot. **1**: 37 (1800).

The known range of this species has recently been extended to within a few miles of the Yukon boundary at Liard Hot Springs, B.C.; Porsild, No. 9078; same place, Anderson and Brown, No. 9905. It probably occurs in Yukon, too.

Drosera rotundifolia L.; Hult., Fl. Al. and Yukon **5** : 893 (1945).

Lower Lapie crossing, Mile 132, No. 11989. The collection consists of a single leaf which was collected accidentally with *Orchis rotundifolia* in a rich poplar wood. The species apparently is very rare in our area, and although searched for on subsequent days, no additional material was found. Otherwise in Yukon the species has been collected in Yukon Valley 50 miles above Stewart River and in Dawson District.

CRASSULACEAE

Rhodiola integrifolia Raf. in Atl. Journ. **1**: 146 (1832).

Sedum Rosea ssp. *integrifolium* Hult., Fl. Al. and Yukon **5** : 895 (1945).

Rose River valley, granite mountain opposite Mile 85-90, No. 10172; alpine slopes west of Mile 95, elevation 5,500 feet, No. 10214; gravelly river-flats near Mile 95, No. 10379; mountain slope east of Mile 95, No. 10509; Rose-Lapie Pass, grassy river-bank near Mile 98-99, No. 11906; same place, on gravel bar near Mile 105, No. 9314; alpine slopes near summit of mountain east of Lapie Lake, elevation 6,000 feet, No. 9397; alpine slopes east of Mile 116, Nos. 10064-A and 10130. In addition the species was noted as common on Mount Sheldon and Mile 250 on the south fork of Macmillan River to Mile 282 in Macmillan Pass. Also from Mayo District: McQuesten River, Christie, No. 50; Edwards and Nelson Creeks, Bostock, No. 69; southwest Yukon: Dawson Range, Bostock, No. 4; Haines Road, Mile 85, Clarke, No. 510; Kluane Lake, Clarke, No. 249. Previously recorded from Dawson District and the Arctic Coast.

The species is common along the Canol Road on river-flats, in herbmats, and on moist alpine slopes; on Mount Sheldon it ascends to 7,200 feet. On Rose River all colonies found were of the staminate plant, whereas in Rose-Lapie Pass only the pistillate plant could be found. Specimens with immature fruits were collected there on July 12. In our area the plant is high-grown, and mature specimens often measure 35 inches in height.

Sedum lanceolatum Torr. ssp. **typicum** Clausen in Cact. & Succ. Journ. of Am. **20** : 145 (1948).

S. stenopetalum Macoun in Ann. Rept. Geol. Surv., Canada, p. 245B (1888); Hult., Fl. Al. and Yukon **5** : 899 (1945), not Pursh.

Whitehorse, shaly banks east of Lewes River, No. 9182; Alaska Highway between Whitehorse and Johnson Crossing, Mile 893, No. 11160; Rose River valley, alpine slope east of Mile 77, elevation 5,500 feet, No. 10952. Also southwest Yukon: Haines Road, Mile 85, Clarke, Nos. 330 and 511; Alaska Highway, Mile 970, Anderson and Brown, No. 10007.

A Cordilleran species which was not seen north of Rose River where flowering specimens were collected on July 4.

SAXIFRAGACEAE

Leptarrhena pyrolifolia (D. Don.) Sér. in DC., Prod. **4** : 48 (1830).

Rose River, mountain range east of Mile 95, in alpine meadows and herbmats, elevation 5,600 feet, No. 10569; northeast shoulder of Mount Sheldon, No. 11080; northwest end of Itsi Range, on alpine slopes above timber-line, opposite Mile 254, No. 11388; upper south fork of Macmillan River, alpine herbmats west of Mile 268, No. 11354.

A Cordilleran species of moist alpine slopes not previously recorded from Yukon. Our specimens are tall and vigorous and in no way differ from material from the Canadian Rockies or from South Alaska. On Rose River some specimens had almost mature fruits, at 5,600 feet elevation, on July 15.

Therofon Richardsonii (Hook.) Kze.; Hult., Fl. Al. and Yukon **5** : 900 (1945).

In Yukon this species has been collected a number of times along the Alaska boundary at least as far north as Porcupine River (Nelles, No. 35). It probably occurs elsewhere in northwest Yukon.

Saxifraga adscendens L., Sp. Pl. 405 (1753).

Upper Rose River, alpine slope near summit of mountain range west of Mile 95, elevation 6,500 feet, No. 11937; Rose-Lapie Pass, rocky summit of mountain east of Lapie Lake, Mile 105, elevation 6,000 feet, No. 10912; upper south fork of Macmillan River, on gravelly flood-plain near Mile 280, No. 11308.

Apparently a very rare species limited to high mountains. The first two numbers each are represented by a single flowering specimen collected July 15-21; No. 11308 consists of five fruiting specimens collected August 31. The specimens differ in no way from material from the Canadian Rockies.

Saxifraga adscendens is new to the flora of Yukon but had previously been reported from three stations in Alaska. Its nearest station to the south is on Mount Selwyn on upper Peace River (Raup).

Saxifraga aizoides L., Sp. Pl. 403 (1753).

Rose-Lapie Pass, shaly cliffs by a waterfall near Mile 105, No. 10909; alpine screes and rocky ledges west of Mile 118, elevation 5,500 feet, No. 10134.

Saxifraga aizoides flowered on June 29 in the Rose-Lapie Pass where it was common on calcareous cliffs and on gravelly river-flats. Thus far it has not been collected in Alaska; and it is new to the flora of Yukon, although common and widely distributed in the calcareous Mackenzie Mountains and on shale and limestone cliffs along Mackenzie River north to Fort Norman and Great Bear Lake, extending southward through mountains of Alberta and British Columbia to latitude 51 degrees. The western plant has been separated as *S. Van-Buntiae* Small, Bull. Torr. Bot. Cl. **25** : 316 (1898), and as *S. aizoides* var. *eu-aizoides* Engler & Irmisch. It tends to be slightly more glandular-pubescent than the eastern plant and is a more decided calciphile.

Saxifraga bronchialis L. ssp. **Funstonii** (Small) Hult.; Hult., Fl. Al. and Yukon **5** : 906 (1945).

Southwest Yukon: Haines Road, Mile 85, Clarke, No. 509; Kluane Lake, 6,000 to 7,000 feet; idem, No. 242; latitude 61° 55′ N., longitude 141° W., Cairnes, Can, No. 85869. Also from a single collection at Lake Bennett and in Dawson District.

A rare western species, in the Yukon thus far collected only in the above-mentioned places but will undoubtedly turn up also in the Ogilvie Range and in the northwestern part.

Saxifraga caespitosa L., Sp. Pl. **1** : 404 (1753).

Upper Rose River, summit of granite mountain west of Mile 95, elevation 6,700 feet, No. 11938; lower Lapie River crossing, rocky ledges on summit of mountain south of Mile 132, elevation 5,600 feet, No. 9933.

Apparently a very rare species in our area where it is restricted to high alpine peaks. At each station only a single specimen was found. Our specimens apparently belong to the ssp. *sileneflora* (Sternb.) Hult., which is new to the flora of Yukon.

Saxifraga cernua L.; Hult., Fl. Al. and Yukon **5** : 910 (1945).

Upper Rose River, in a rocky canyon near Mile 95, No. 10461; Rose-Lapie Pass, moist, shaded ledges of mountain east of Mile 105, elevation 5,600 feet, No. 10910; lower Lapie Crossing, dry, rocky summit of mountain south of Mile 132, No. 9934. Also from Alaska Highway, Mile 1136, Anderson, No. 10302, and Kluane Lake, idem, No. 9438.

Apparently a rare species in our area where it is restricted to high mountains. In Yukon previously recorded only from the Arctic Coast.

Saxifraga ferruginea Graham in Edinb. New Phil. Journ. 348 (1829).

This species has been collected in White Pass and on Haines Road just south of the Yukon boundary (Hult., l.c.) and also on upper Peel River, N.W.T., near the Yukon border. It may be expected, therefore, to turn up in mountains of Yukon.

Saxifraga flagellaris Willd.; Hult., Fl. Al. and Yukon **5** : 915 (1945).

Dawson Range, latitude 62° 35′ N., longitude 138° 20′ W., Bostock, Nos. 5 and 257. Also from two collections from the Alaska-Yukon boundary near Black River (Cairnes). It has been recorded, moreover, from the east slope of Mackenzie Mountains along the Canol Road and from Richardson Mountains west of the Mackenzie Delta (Porsild) and probably is common in the Ogilvie Range.

Saxifraga hieracifolia Waldst. & Kit.; Hult., Fl. Al. and Yukon **5** : 918 (1945).

Southwest Yukon: Dawson Range, latitude 62° 35′ N., longitude 138° 20′ W., Bostock, Nos. 6, 258, 259, and 260; Kluane Lake, Burwash Landing, 6,000 to 7,000 feet, Clarke, No. 248. Also from Dawson District and from the Arctic Coast. It is found also in Mackenzie Mountains along the Canol Road and in Richardson Mountains west of Mackenzie and probably is common in mountains of northwest Yukon.

Saxifraga Hirculus L.; Hult., Fl. Al. and Yukon **5** : 920 (1945).

In the Yukon so far recorded only from Kluane Lake and from Old Crow River, but as it is common in the mountains west of Mackenzie Delta and was found along the Canol Road on the east slope of Mackenzie Mountains, it probably is common also in the mountains of northwest Yukon.

Saxifraga Lyallii Engler.; Hult., Fl. Al. and Yukon **5** : 922 (1945).

Upper Rose River, alpine slope west of Mile 95 by a brook, elevation 5,500 feet, No. 11935; Rose-Lapie Pass, moist ledges of mountain west of Mile 118, No. 10133; south shoulder of Mount Sheldon, wet places in alpine fir forest, elevation 4,500 feet, No. 11677; south fork of Macmillan River, grassy river-banks near Mile 250, No. 11431; by a spring on mountain west of Mile 268, No. 11356; Macmillan Pass, in wet places by a stream, No. 11240. Also from Mayo District, McQuesten River, Christie, Nos. 52 and 53; Rupe Creek, Bostock, No. 75; Dawson Range, 62° 35′ N., 138° W., idem, No. 261; Haines Road, Mile 85, Clarke, No. 505; Kluane Lake, idem, No. 247.

Occasional to common on moist subalpine slopes and in wet moss by brooks, ascending to slightly above timber-line and apparently restricted to acid rocks. In the Lapie Pass the species flowered by end of June and on Mount Sheldon had mature fruits by mid-August, but flowering specimens were still in evidence in Macmillan Pass on September 1. The series is remarkably uniform. The known range of this species was recently extended to Mackenzie Mountains, N.W.T. (Porsild, 1945). In the Yukon previously known from a single collection from the vicinity of Whitehorse.

Saxifraga nivalis L.; Hult., Fl. Al. and Yukon **5** : 924 (1945).

Rose River valley, alpine slope of mountain east of Mile 85-90, elevation 6,000 feet, No. 10177; Lapie River, shaded ledges in canyon of Ram Creek opposite Mile 127, No. 10018; southeast corner of Mount Sheldon on rocky ledges, elevation 5,000 feet, No. 11745; upper south fork of Macmillan River, gravel outwash plain opposite Mile 280, No. 11309. Also from Mayo District, Ladue River, Bostock, No. 74, and Frances River, latitude 61°, Dawson, Can, No. 9379.

In North America *S. nivalis* is common in the eastern Arctic but progressively becomes less common toward the west. In the Northwest Territories the known northwestern limit is on Great Bear Lake. It is rare in Mackenzie Mountains and in southeast Yukon, where it is restricted to high mountains. Apparently it is absent in central and northern parts of Yukon and Alaska where earlier records refer to *S. reflexa*. From mountains of extreme northern British Columbia *S. nivalis* extends along the Pacific coast of Alaska north to Point Hope. The species apparently does not occur in the Cordillera south of 58 degrees N.

Saxifraga oppositifolia L.; Hult., Fl. Al. and Yukon **5** : 926 (1945).

Rose River valley, alpine slope of mountain east of Mile 85-90, elevation 6,000 feet, No. 10178; Rose-Lapie Pass, summit of mountain east of Mile 105, No. 9338; cliffs and rocky ledges of mountain west of Mile 118, No. 10135. Also noted on Mount Sheldon and on mountains of the upper Macmillan River. Also from Mayo District, Ladue River, Bostock, Nos. 73 and 214; Alaska-Yukon boundary, 67° 10′ N. and 141° W., Cairnes, No. 22; north fork of Klondike River, Cockfield, No. 28; Alaska Highway, Mile 1136, Anderson and Brown, No. 10307, and Kluane Lake, Clarke, No. 243.

An alpine species which is occasional to common on high mountains in the Yukon; on Mount Sheldon ascending to 7,000 feet. In the Rose-Lapie Pass flowering and fruiting specimens were collected on June 29.

Saxifraga oppositifolia L. var. **Smalliana** E. & I., *See* Porsild, Rhod. **41** : 241 (1939).

S. pulvinata Small in Bull. N.Y. Bot. Gard. **2** : 172 (1901).

A peculiar and rather striking variety which differs from the species by having the leaves densely imbricated in 4 rows, as in *Cassiope tetragona,* and by having its flowers on short, naked peduncles. The type came from Lake Bennett, (Tarleton, No. 11, N.Y.) In addition, the writer has seen specimens from Seward Peninsula, Alaska, Great Bear Lake, and from high mountains of British Columbia.

Saxifraga punctata L. ssp. **insularis** Hult. in Sv. Bot. Tidskr. **30** : 524 (1936) fig. 5.

Pass between Teslin and Nisutlin Rivers, by alpine brook, elevation 6,000 feet, No. 10996; Rose River, mountain east of Mile 85-90, in wet moss by a brook, elevation 6,000 feet, Nos. 10174 and 10175; alpine valley west of Mile 95, No. 11939; lower Lapie River crossing, grassy summit of mountain south of Mile 132, No. 9935; south shoulder of Mount Sheldon, in open alpine fir forest, elevation 4,500 feet, No. 11678. Also noted as common on mountains of Macmillan River and pass at Mile 250, 268, and 282. Also Mayo District, Rupe Creek, Bostock, No. 71; Edwards Creek, idem, No. 70; McQuesten River, Christie, No. 51; Rambler Hill, McQuesten Lake, Cockfield, No. 13.

Saxifraga punctata ssp. *insularis* is occasional to common in wet moss on high mountains along the Canol Road where it flowered from late in June and matured fruits from mid-July.

Hultén, l.c., recognizes three geographic races of *S. punctata* which he separates primarily on the texture and degree of pubescence of leaves and flowering stems, and on the shape of the filaments. The geographic ranges of these races are said to be as follows: ssp. *Nelsoniana,* with leaves viscid-pubescent on both sides, extends from islands and shores of Bering Sea region along the north coast of Alaska to the west side of Mackenzie Delta, thence southward via Richardson Mountains to unglaciated mountains of central Yukon and Alaska; ssp. *pacifica* [*S. arguta* D. Don], with thin, essentially glabrous leaves and strongly clavate filaments, is restricted to the Pacific coast of Alaska, where it reaches west to Unalaska, south to Oregon and eastward to southeast British Columbia and Alberta; and finally ssp. *insularis,* with fleshy, essentially glabrous and nerveless leaves, usually purplish petals, linear filaments, and stout, purplish black follicles, ranges from the extreme west end of Alaska Peninsula, Pribilof Islands, and the Aleutians to south Kamtchatka.

Hultén admits that these "major races" intergrade where their ranges overlap and that, although ssp. *insularis* is the only race found on the Aleutian Islands, there is no sharp line of demarcation between it and ssp. *Nelsoniana.* Actually the characters used for separation are all somewhat unstable, particularly the shape of the filaments which may vary even within a single flower.

From a phytogeographical point of view the least satisfactory of these three races is the ssp. *insularis,* which is intermediate between extreme of ssp. *Nelsoniana* and ssp. *pacifica,* because, in the mountains of northern Alberta and British Columbia north to southeastern Yukon, Brintnell

Lake, Mackenzie Mountains (Raup), central Alaska (Talketna, Anderson, August 9, 1931, Can), and occurring again (as the only race) around Great Bear Lake, Coronation Gulf, and central Keewatin, there occurs a plant which is inseparable from ssp. *insularis* of the Aleutian Islands. As correctly stated by Hultén, the race that extends along the north coast of Alaska and Yukon to the Mackenzie Delta and south to mountains of central Alaska and Yukon is ssp. *Nelsoniana*. In Yukon the ranges of these two races apparently do not overlap.

Saxifraga punctata L. ssp. **Nelsoniana** (D. Don) Hult., Fl. Kamtch. **3**:25 (1929); Hult., Fl. Al. and Yukon **5**:929 (1945), pro max. pte.

In addition to the Yukon specimens in the National Herbarium cited by Hultén, l.c., there are before me the following specimens from central western Yukon: Miller Creek, 64° N., 140° 50′ W., Cairnes, Can, No. 93315, and from the Arctic Coast: Shingle Point, Porsild, No. 7107 and 6729; Kay Point, idem, No. 7146, and Richardson Mountain, N.W.T., Porsild, Nos. 6686 and 6824.

Saxifraga radiata Small; Hult., Fl. Al. and Yukon **5** : 933 (1945).

Lower Lapie crossing, alpine slope south of Mile 132, elevation 5,000 feet, No. 9620; Rose River valley near north end of Sheldon Lake, No. 11557; south shoulder of Mount Sheldon, in open alpine fir forest, elevation 4,500 feet, No. 11679. Also Mayo District: McQuesten River, Christie, No. 54; Swede Creek, Bostock, No. 48; Ogilvie Mountains near Alaska border, J. & E. Lohbrunner, No. 12096; also in Dawson District and on the Arctic Coast. Noted also in Macmillan Pass and in Richardson Mountains west of Mackenzie Delta. (Porsild, Nat. Mus., Canada, Bull. **101** : 22 (1945)).

Saxifraga radiata flowered in Pelly Mountains on June 15 and on Mount Sheldon had almost mature fruits on August 10. The claws of the petals are strongly purple-veined. It is a rare species and was seen nowhere else on the Canol Road.

Saxifraga reflexa Hook.; Hult., Fl. Al. and Yukon **5** : 934 (1945).

Micranthes yukonensis Small in N. Am. Fl. **22** : 145 (1905).

Upper Rose River, west slope of range east of Mile 95, No. 10511; same place, alpine slopes west of Mile 95, No. 10215; Rose-Lapie Pass, summit of mountain east of Mile 105, Nos. 9398 and 10911; southeast slope of mountain west of Mile 116, No. 10066; Lapie River crossing, grassy summit of mountain south of Mile 132, Nos. 9619 and 9936. Southeast Yukon, Haines Road, Mile 85, Clarke, Nos. 506 and 507; boundary, M. P. and R. T. Porsild, No. 198; Kluane Lake, Clarke, No. 246, and from Dawson District.

Apparently a rare species along the Canol Road, where it was noted only at high altitudes in the calcareous Pelly Range. In Rose-Lapie Pass it ascends to 6,000 feet. Flowering specimens were noted on June 11 and mature fruits on July 21.

The species is very variable as to stature, degree of pubescence, and amount of branching; thus, in most colonies specimens varying in height from 8 to 30 cm. may be observed. In dry habitats the leaves are hoary pubescent, whereas in moist places they may be almost glabrous. The petals, likewise, vary in shape and colour and frequently have no yellow spots. Our No. 10511 is 30 cm. high, branched almost to the base with branches 8 cm. long. (Compare also Hultén, l.c.)

An equal range of variation was noted by the writer in the type locality (Arctic Coast east of Mackenzie Delta).

Saxifraga rivularis L.; Hult., Fl. Al. and Yukon **5** : 935 (1945).

Upper Rose River, on gravelly outwash fan opposite Mile 95, No. 10441; same place, by a brook, No. 10462; same place, alpine slope, No. 10510; alpine valley west of Mile 95, elevation 5,600 feet, Nos. 10568, 11934, and 11936; upper south fork of Macmillan River, on gravel outwash plain opposite Mile 280, No. 11310. Also Mayo District, Bostock, Nos. 213 and 215.

Although in Yukon previously recorded only from the Arctic Coast, *S. rivularis* apparently is common on high mountains of the interior where it ascends at least to 6,000 feet. On Rose River fruiting specimens were collected on July 12. The Yukon plant is the slender, small-flowered var. *flexuosa* (Sternb.) Engl. & Irm.

Saxifraga serpyllifolia Pursh; Hult., Fl. Al. and Yukon **5** : 937 (1945).

North fork of Klondike River, Cockfield, No. 29. In Yukon otherwise known only from Donjek River of southwest Yukon.

This rare species was recently recorded from the east slope of Mackenzie Mountains along the Canol Road (Porsild, 1945).

Saxifraga spicata D. Don; Hult., Fl. Al. and Yukon **5** : 938 (1945).

S. galacifolia Small in Bull. N.Y. Bot. Gard. **2** : 172 (1901).

In Yukon so far known from a single station in Dawson District.

Saxifraga tenuis (Wahlenb.) H. Smith in Lindm. Sv. Fanerogamfl. 300 (1918).

S. nivalis var. *tenuis* Hult., Fl. Al. and Yukon **5** : 925 (1945).

Rose River, summit of mountain east of Mile 85-90, elevation 6,000 feet, No. 10176; in a rocky canyon near Mile 95, No. 10460; Rose-Lapie Pass, rocky summit of mountain east of Mile 105, elevation 6,000 feet, No. 10913. Also from Dawson Range, 62° 35′ N., 138° W., Bostock, No. 256, and north fork of Klondike, Cockfield, No. 31.

Hultén, l.c., p. 925, considers this plant a variety of *S. nivalis* "occurring here and there" within the range of that species. This may be so in Scandinavia, but the plant which in arctic North America has been referred to *S. tenuis* seems sufficiently well marked to merit specific status. Besides being of lower stature and a more slender and delicate plant, it differs consistently from *S. nivalis* by the presence of a rusty brown pubescence on the underside of the leaves and on the leaf petioles, as well as by its pink to purplish petals. The inflorescence is few-flowered, densely capitate during anthesis; later, some of the lower peduncles elongate. In its rusty pubescence of the leaves *S. tenuis* resembles *S. rufidula* Small of the Pacific coast of British Columbia and Washington but unlike that species has glandular pubescent peduncles.

Saxifraga tricuspidata Rottb.; Hult., Fl. Al. and Yukon **5** : 939 (1945).

Rose-Lapie Pass, sandy hillside near Mile 102, No. 9361; summit of mountain east of Mile 105, No. 9401; lower Lapie Crossing, on dry river terrace near Mile 132, Nos. 9272 and 9683; upper south fork of Macmillan River, alpine slopes west of Mile 268, No. 11355.

A common species throughout the Yukon, inhabiting dry slopes and cliffs; on Mount Sheldon ascending to 7,200 feet. In the Rose-Lapie Pass *S. tricuspidata* flowered on June 10. In No. 9361 the leaf-margins are nearly all entire.

Mitella nuda L., Sp. Pl. 406 (1753).

Johnson Crossing, M. P. and R. T. Porsild, No. 756; west bank of Nisutlin River, in open, mossy spruce woods near Mile 36, No. 10814; Quiet Lake, in rich woods east of Lake, Mile 55-60, No. 11116; Rose River valley, in wet places in pine bog near Mile 77, elevation 3,000 feet, No. 10292.

A lowland species, common in mossy places in rich spruce and pine woods in the southern part of our area but not seen north of the last-mentioned station. Flowering specimens were collected on July 4 and fully mature fruits on July 26.

The species is new to the flora of Yukon.

Mitella pentandra Hook. in Curtis's Bot. Mag. **56**, tab. 2933 (1829).

Upper Rose River in subalpine meadow above timber-line, elevation 5,000 feet, west of Mile 95, No. 11933. The species apparently is very rare, and only two specimens were seen.

Our specimens are well developed and flowered on July 15. The species is new to the flora of Yukon.

Chrysosplenium tetrandrum (Lund) Fries; Hult., Fl. Al. and Yukon **5** : 949 (1945).

Pass between Teslin and Nisutlin Rivers, in wet places by a spring east of Mile 10-14, elevation 4,500 feet, Nos. 11040 and 11139; upper Rose River, in wet places on flood-plain near Mile 95, No. 10378; Rose-Lapie Pass, wet cliffs on upper slope of mountain east of Mile 105, elevation 5,000 feet, No. 10908; lower Lapie Crossing, on wet mud by a moose-lick near Mile 132, No. 9428; same place, in wet peaty soil along a bulldozer trail, No. 9546; same place, in rich poplar wood, No. 9836; upper south fork of Macmillan River, in wet moss by a spring west of Mile 268, elevation 5,000 feet, No. 11352. Also noted on Mount Sheldon and in Macmillan Pass.

Common to occasional throughout Yukon but chiefly in the lowlands, in wet moss or in peaty soil near springs or brooks. At Mile 105 on the Canol Road ascending to 5,000 feet. In Pelly Mountains *Chrysosplenium tetrandrum* flowered on June 12 and had mature fruits on July 30. Most of our specimens are unusually tall, No. 9836 measuring 15 cm.

Chrysosplenium Wrightii Franch. & Sav. Enum. Pl. Japon. **2** : 356 (1879); Hult., Fl. Al. and Yukon **5** : 951 (1945).

C. Beringianum Rose.

According to Hultén, l.c., collected twice in southeast Yukon.

Parnassia fimbriata Konig; Hult., Fl. Al. and Yukon **5** : 952 (1945).

Upper Rose River, alpine slopes west of Mile 95, No. 10213; in wet sand on flood-plain near Mile 95 (growing with *Parnassia Kotzebuei* and *P. palustris* var. *neogaea)*, No. 10380; Rose-Lapie Pass, rocky chimney east of Mile 118, 10132; Mount Sheldon, steep ravines and ledges near timber-line, elevation 4,500 feet, No. 11721; upper south fork of Macmillan River, shale mountain west of Mile 268, No. 11353. Noted in Macmillan Pass. Also Swift River, No. 9117, and Haines Road, Mile 95, Clarke, No. 513.

A Cordilleran alpine species, common along the Canol Road by alpine brooks and in ravines near and above timber-line; on Mount Sheldon ascending to 5,600 feet. It flowers from first week of July, and first mature fruits were noted on Mount Sheldon on August 3. In Yukon previously recorded from Fort Selkirk.

Parnassia Kotzebuei Cham. & Schlecht.; Hult., Fl. Al. and Yukon **5** : 953 (1945).

Johnson Crossing, M. P. and R. T. Porsild, No. 627; alluvial flats west of Nisutlin River, Mile 34-42, No. 10813; Rose River, pine and spruce bogs near Mile 77, No. 10293; in wet sand on flood-plain near Mile 95, Nos. 10382 and 10383; Rose-Lapie Pass, in wet places on flood-plain near Mile 105, No. 9518; in wet places in rock chimneys of mountain west of Mile 118, No. 10131; lower Lapie Crossing, in herbmats near timber-line on mountain west of Mile 132, elevation 5,000 feet, No. 9762; same place, in rich poplar wood, Nos. 9578 and 9837; south shoulder of Mount Sheldon, in a *Scirpus caespitosus* bog, No. 11676; south fork of Macmillan River, on grassy river-bank near Mile 250, No. 11430.

A common species throughout the Yukon. Along the Canol Road it usually grows in wet sandy places on flood-plains, often associated with *P. fimbriata* and *P. palustris* var. *neogaea* but rarely ascends above timber-line. Flowers were noted from early June and mature fruits by end of July. Flowering specimens are low, usually 10 to 15 cm. high, but the fruiting scape elongates considerably and may be over 30 cm. tall (No. 10813). The basal leaves are very variable and in the same clone may be either lanceolate or cordate.

Parnassia montanensis Fern. & Rydb. in N. Am. Fl. **22** : 79 (1905); Bakewell, Rhod. **45** : 311 (1943).

Minto Bridge north of Mayo, Cockfield, July 1918, Can, No. 97716. Also from Liard Hot Springs, B.C., near the Yukon border, Clarke, No. 75. In Yukon otherwise known only from Kluane Lake (Bakewell).

Parnassia palustris L. var. **neogaea** Fernald in Rhod. **39** : 311 (1937).

P. palustris ssp. *neogaea* Hult., Fl. Al. and Yukon **5** : 954 (1945).

Johnson Crossing, M. P. and R. T. Porsild, No. 586; Rose River, in wet places by a creek near Mile 77, No. 10294; upper Rose River, in wet sand on flood-plain near Mile 95, No. 10381; lower Lapie River, gravelly river-flat near Mile 127, No. 10017; Pelly River valley, in wet sand by lake shore near Mile 136, No. 9781; Mount Sheldon, in subalpine meadows near Mile 226, No. 11478; south fork of Macmillan River, river-banks near Mile 250, No. 11429.

A lowland species which is common throughout the Yukon on flood-plains and in river meadows. Along the Canol Road it flowered a month later than *P. Kotzebuei* with which it was often associated. On Rose River flowers were first noted on July 11; whereas on Mount Sheldon it flowered in mid-August and probably does not always mature fruits. No Yukon material of typical *P. palustris* is present in the series listed above or in the large additional series, from elsewhere in the Yukon, preserved in the National Herbarium of Canada.

Ribes glandulosum Grauer, Pl. Min. Cog. 2 (1784).

R. prostratum L'Hér.

Rose River valley, in open pine bogs near Mile 77, No. 10297; upper Rose River, forested slope near timber-line east of Mile 85-90, No. 10173; lower Lapie Crossing, in rich poplar woods near Mile 132, No. 9835; lower forested slopes of Mount Sheldon near Mile 222, elevation 3,500 feet, Nos. 11722 and 11724. Also noted on Nisutlin River and at Quiet Lake.

Although not previously reported for Yukon, the species apparently is not uncommon in our area where it is a lowland plant of rich woods. On Lapie River it had flowers and well-formed young fruits on June 22, and on Mount Sheldon it fruited abundantly on August 3.

Hultén, l.c., 962-3, on phytogeographical grounds, questions his own determination of certain collections from Alaska and also the report by Sharples, in Alaska Wild Flowers, 124 (1938), that it "abounds" in the interior. More recent collections from central Alaska, e.g., Manly Hot Springs, Anderson, No. 7081 (Can), together with the present series collected by the writer in southeast Yukon, suggest that, with due allowances for our still woefully incomplete knowledge of the flora of central Alaska and Yukon, the range of *R. glandulosum* may yet prove continuous.

Ribes hudsonianum Richards.; Hult., Fl. Al. and Yukon **5** : 959 (1945).

Whitehorse, river-banks east of town, No. 9181; Johnson Crossing, M. P. and R. T. Porsild, Nos. 560 and 628; Rose River valley, poplar woods near Mile 132, No. 9579; same place, open spruce woods, No. 9617; forested lower slopes of Mount Sheldon, near Mile 222, No. 11723; south fork of Macmillan River, in a muskeg near Mile 250, No. 11428. Also Mayo District: Mayo, Anderson, No. 9687; McQuesten River, Christie, No. 56, and Yukon Valley.

A lowland species which is not uncommon in open woods; on Mount Sheldon ascending to 4,000 feet. The species flowered on June 1 at Whitehorse and on Lapie River had flowers and small, green fruits on July 17; at Mount Sheldon it had fully ripe fruits on August 3.

Ribes lacustre (Pers.) Poir.; Hult., Fl. Al. and Yukon **5** : 960 (1945).

In rich woods on west bank of Nisutlin River near Mile 36-42, No. 10815; Rose River valley, open pine woods near Mile 77, No. 10296; Rose-Lapie Pass, in rocky scree on mountain west of Mile 118, elevation 4,500 feet, No. 10129; lower Lapie Crossing, gravelly river terrace near Mile 132, No. 9547; Pelly River valley, dry slopes near Mile 138, No. 9666. Previously recorded from Mayo and Dawson Districts.

A lowland species, which along the Canol Road is restricted to dry, sunny, calcareous slopes and to rich woods where it is never common. On Lapie River, the species flowered on June 16 and on Nisutlin River had fully mature fruits on July 23.

Ribes laxiflorum Pursh, Fl. Am. Sept. 731 (1814).

By Hultén, Fl. Al. and Yukon **5** : 961 (1945), reported from Lake Dease, [B.C., on the upper Liard drainage] erroneously included in the "Upper Yukon R. Distr.," although correctly marked on the map fig. 739. *R. laxiflorum* thus should be excluded from the flora of Yukon.

Ribes oxyacanthoides L.; Hult., Fl. Al. and Yukon **5** : 962 (1945).

Johnson Crossing, M. P. and R. T. Porsild, No. 561; gravelly west bank of Nisutlin River, Mile 36, No. 10816; Rose-Lapie Pass, rocky slope of mountain west of Mile 116, elevation 5,000 feet, No. 10065; lower Lapie Crossing, gravelly river-flats near Mile 132, No. 9990; dry shaly slope of mountain west of Mile 132, No. 9864.

Of similar distribution and occurrence as *R. lacustre* but fruiting somewhat earlier. On Nisutlin River this gooseberry formed small colonies on gravel bars on flood-plains. The fruit is edible but is rarely seen in appreciable quantity. In Yukon previously known from a single station in Yukon Valley.

Ribes triste Pall.; Hult., Fl. Al. and Yukon **5** : 963 (1945).

Lower Lapie crossing, in rich poplar woods near Mile 132, No. 9580; same place, open, alpine spruce forest on mountain south of Mile 132, elevation 4,500 feet, No. 9618; Ross River valley, dense spruce woods near Sheldon Lake, No. 11558.

A common lowland species which is common throughout the territory and which was recorded by us from all stations north to Macmillan Pass. *R. triste* grows on river-banks and in open, mossy spruce woods where the canes are often 4 to 5 feet high. On Lapie River it had flowers and well-formed green fruits on June 17 and on Sheldon Lake fruited abundantly on August 6. In taste the berries are very similar to that of the cultivated red currant.

ROSACEAE

Spiraea Beauverdiana Schneid.; Hult., Fl. Al. and Yukon **6** : 981 (1946).

Ross River valley, in muskeg forest near Sheldon Lake, Mile 222, No. 11559; upper south fork of Macmillan River, mountain west of Mile 268 in alpine meadow near snowflush, elevation 5,500 feet, No. 11357. In Yukon previously known from Lake Bennett region, Dawson and Mayo Districts.

Common in open muskegs and in alpine meadows from Mount Sheldon to Macmillan Pass where it ascends to 5,600 feet. On the Canol Road not noted south of Sheldon Lake where the species had mature fruits on August 1.

Luetkea pectinata (Pursh) Ktze. Rev. Gen. 217 (1891).

Pass between Teslin and Nisutlin Rivers, on rocky summit of mountain east of Mile 10, elevation 6,000 feet, No. 11042; upper Rose River, gravelly flood-plain near Mile 95, No. 10389. The species was noted also in alpine meadow west of Mile 95 and again as very scarce on an inaccessible rock ledge on southwest corner of Mount Sheldon at 6,000 feet elevation. Also Haines Road, Mile 85, Clarke, No. 504; same place near boundary, M. P. and R. T. Porsild, No. 206.

Luetkea pectinata flowered on Rose River on July 11. It is new to the flora of Yukon, and the present collection bridges a gap between south and southeastern Alaska and mountains west of Mackenzie Delta (Porsild, 1943).

Sorbus scopulina Greene in Pittonia **4** : 130 (1900).

S. alaskana Jones. *See* Hult., Fl. Al. and Yukon **6** : 989 (1946).

Quiet Lake, densely wooded slope near Mile 55-60, No. 11117; Ross River valley, in subalpine fir forest near north end of Sheldon Lake, Mile 222, No. 11560; southeast shoulder of Mount Sheldon, open rocky slope near timber-line, elevation 4,500 feet, No. 11725. Also Mayo District, Ladue River, Bostock, No. 88; southwest Yukon, Haines Road, Lake Dezadeash, Clarke, No. 425.

Our specimens flowered at Quiet Lake on July 4 and on Mount Sheldon had almost mature fruits on August 3. The species is new to the flora of Yukon.

Sorbus sitchensis Roem.; Hult., Fl. Al. and Yukon **6** : 989 (1946).

According to Hultén, l.c., recorded from Lake Bennett.

Amelanchier alnifolia (Nutt.) Nutt.; Hult., Fl. Al. and Yukon **6** : 991 (1946).

Whitehorse, dry open slope east of Lewes River, No. 9192; Alaska Highway between Whitehorse and Johnson Crossing, Mile 893, No. 11161; alluvial flats along west bank of Nisutlin River, Mile 36-46, No. 10817; Rose-Lapie Pass, dry slope near timber-line on mountain west of Mile 116, elevation 4,500 feet, No. 10067. Also from several stations along the Yukon, north to Dawson.

Rare to occasional along the Canol Road on dry sunny slopes north to Rose-Lapie Pass where it flowered in July, or one month later than at Whitehorse; on the Nisutlin River the species had well-formed but not quite ripe fruits on July 23.

Amelanchier florida Lindl.; Hult., Fl. Al. and Yukon **6** : 991 (1946).

According to Hultén, l.c., in Yukon doubtfully recorded from Whitehorse by Britton & Rydberg.

Rubus acaulis Michx.; Hult., Fl. Al. and Yukon **6** : 993 (1946).

Whitehorse, low hummocky river-flat, No. 9190; pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 10-14, No. 11000; Nisutlin River, in sphagnum bogs west of Mile 42, No. 10818; lower Lapie Crossing, in rich poplar woods, Mile 132, No. 9581; Pelly River valley, by small lake in muskeg near Mile 136, No. 9890. The species flowered at Whitehorse on June 1 and on Nisutlin River had mature fruits on July 23. Common throughout the Yukon in muskeg and mossy woods of the lowlands.

The present series belongs to the low, almost "stem-less" form with near-glabrous and glandless calyx and non-scented flowers. For a discussion of this and related species, see under *R. arcticus* and compare also Bailey in Gentes Herbarum **5**, fasc. 1 (1941), and Hultén, l.c., 993-7.

Rubus alaskensis Bailey in Gentes Herbarum **5**, fasc. 1 : 30, tab. 8 (1941).

R. arcticus x *stellatus* Hult., Fl. Al. and Yukon **6** : 996 (1946), in part.

Northeast shoulder of Mount Sheldon, forming a dense undergrowth in alder thickets near timber-line, elevation 4,500 feet, No. 11082; same place, open avalanche paths, No. 11083; Macmillan Pass, sunny, willow-covered slope above timber-line, Mile 284, elevation 5,500 feet, No. 11242; same place, in a river meadow, No. 11243.

A trailing shrub with stout, 3 mm. thick, lignified, rooting stolons from which the 20 to 40 cm. high and 2 mm. thick, flowering canes rise; these with from 3 to 7 leaves on 5 to 7 cm. long petioles bearing 1 cm. long, linear stipules; leaves, 3-nate, of thick texture, dark green and glabrous above, and somewhat paler beneath, with soft, spreading hairs on all veins; leaflets, sessile or short-petiolate, ovate, 5 to 6 cm. long and 3 to 5 cm. wide, the lateral somewhat oblique, the terminal rhomboid with a cuneate base; the leaf margins, double serrate with about three large teeth per centimetre; flowers scentless, about 2 cm. in diameter, 2 to 3 from the upper leaf axils, on 3 to 4 cm. long peduncles; calyx lobes, soft pubescent, triangular, reflexed in age, 1 cm. long, often lacinate and not infrequently abnormally enlarged and leaf-like; petals, rose-pink, 1·3 cm. long (including claw), 9 mm. wide, obtuse-ovate. Double flowers are not infrequent.

The purplish-brown flowering canes and the leaf petioles are sparingly soft pubescent. In the 50-odd sheets collected by us, not all individuals have the pecular stiff, brown, and gland-tipped hairs that according to Bailey are characteristic of this species.

On Mount Sheldon most specimens were still in flower on August 13, and although the flowers appeared normal, the species probably does not at present mature fruits but is propagated vegetatively.

Rubus alaskensis is a strikingly handsome species which formed dense masses on alpine slopes near timber-line that at the time of our visit showed pink from a distance due to the showy flowers.

Hultén, l.c., who has not seen authentic material of *R. alaskensis,* considers it a hybrid between *R. arcticus* and *R. stellatus,* suggesting that its peculiar gland-tipped hairs are inherited from *R. arcticus.* It is true that certain characteristics of our plant, such as the presence of double flowers and the often abnormally enlarged and leaf-like calyx lobes are suggestive of hybrid vigour, but, on the other hand, there is nothing in the appearance of our plant to suggest *R. stellatus* as the one parent. Moreover, its appearance on Mount Sheldon and in Macmillan Pass, in two widely separated areas, strongly suggests that it is a relic that has been isolated there a long time.

The writer has examined the following specimens from or near the type locality in Alaska: Anderson, Nos. 6981, 7028, 7606, and 7691 (Can). These are all similar to ours but less stout. A specimen cited and annotated by Hultén as *R. arcticus* x *stellatus,* from Cape Vancouver [not Nunivak Island] Alaska, J. M. Macoun, August 9, 1891 (Can), bears no resemblance whatsoever to our plant.

Rubus alaskensis was previously known only from the Susitna Valley in Alaska, 600 miles southwest of Mount Sheldon.

Rubus arcticus L.; Hult., Fl. Al. and Yukon **6** : 994 (1946).

Johnson Crossing, M. P. and R. T. Porsild, No. 638; pass between Teslin and Nisutlin Rivers, treeless, subalpine meadow near Mile 14, No. 11141; same place, open grassy slope on mountain east of Mile 10, elevation 5,000 feet, No. 11041; Rose River valley, open pine bogs near Mile 77, No. 10299; upper Rose River, in old burns near Mile 95, No. 10463; Rose-Lapie Pass, alpine meadows on mountain east of Mile 105, elevation 5,000 feet, No. 10917; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11480.

The present series represents the Alaska-Yukon plant which Hultén, l.c., considers *R. arcticus.* When examined collectively they seem abundantly distinct, on the one hand, from the low, early flowering *R. acaulis* and, on the other, from the tall, robust *R. alaskensis* or the 3-lobate *R. stellatus.* Nevertheless, it must be admitted that several individual plants can be selected that connect our series of *R. arcticus* with *R. acaulis.* Actually the present segregation is based to some extent on field experience with these plants rather than on tangible taxonomical differences. The material all differs from Scandinavian *R. arcticus* by the larger flowers and narrower petals.

Rubus arcticus in our area, like *R. alaskensis,* is late flowering and restricted to alpine slopes above timber-line. Although the flowers appear to be perfectly normal, the species probably does not fruit well due to the lateness of the habitat, and *R. arcticus,* therefore, is considered a member of an alpine Yukon relic flora. The flowers are very fragrant.

The field "characters" used to separate *R. acaulis, R. alaskensis, R. arcticus,* and *R. stellatus* are shown in the following tabulation, which was made in the field:

	R. acaulis	*R. arcticus*	*R. alaskensis*	*R. stellatus*
Leaf-shape	3-nate	3-nate	3-nate	3-lobed
Texture and colour of leaf	Thin, dull green above, paler beneath	Thin, dark green on both sides, ± shiny above	Thick, dull green above, slightly paler beneath	Rather thick, dull green above, paler beneath
Dimensions of terminal leaflet	1·5-3·0 cm. long, 1·5-2·0 cm. wide	4-5 cm. long, 3-4 cm. wide	5-6 cm. long, 3-5 cm. wide	
Margin of leaflets	Sharp serrate	Obtuse, ± double serrate	Double serrate with large teeth	Obtuse, ± double serrate
Stipules	Lanceolate-linear, not prominent	Ovate, prominent	Linear	Lanceolate, rather prominent
Stem	Low, 5-10 cm. high, almost stemless, flower hidden among leaves	20-30 cm. high, slender, with 2-4 leaves	25-40 cm. high, robust, with 5-7 leaves	10-20 cm. high, with about 3 leaves
Vestiture of stem and petioles	Soft pubescent to glabrate, no stipitate glands	Glabrous to soft pubescent, occasionally with a few stipitate glands	Soft pubescent, occasionally with prominent dark brown stipitate glands	Soft pubescent, always glandless
Flower	Single, 2-3 cm. in diameter, claws narrow	One to two, 1·5-2·0 cm. in diameter, claws broad	One to three, 2 cm. in diameter	Single, 2-3 cm. in diameter, petals broad, often retuse
Fragrance	None	Fragrant	None	Very fragrant
Sepals	Narrow-attenuate, glabrous below, glandless	Attenuate-triangular, pubescent, ± glandular	Prominent, triangular, often ± leaf-like, glandless	Triangular-attenuate, short pubescent throughout, glandless
Time of flowering	Early	Late	Late	Late
Fruiting (in south-east Yukon)	Good	Poor	Sterile	Sterile or poor
Habitat	Lowland, general (widely distributed)	Alpine (relic type)	Alpine (relic type)	Alpine (relic type)

The specimens in the series given below represent plants that are intermediate between *R. acaulis* and *R. arcticus.* Except for their somewhat larger size and the presence of some glands on the calyx, these plants are much closer to *R. acaulis* than to *R. arcticus.* All grew in places such as inhabited by *R. acaulis* and flowered early. The fruits, when present, were rather dry and pulpless.

East slope of Rose River valley, in mossy pine woods near Mile 77, No. 10298; upper Rose River alpine slopes west of Mile 95, elevation 5,000 feet, No. 10216; same place, in grassy places on river-flat, No. 10386 (flowers fragrant); same place, wooded slope, No. 10387; Rose River valley, in dense spruce woods near Sheldon Lake, No. 11563.

In his discussion of *R. arcticus* and its alleged hybrids, Hultén, l.c., expresses the view that *R. paracaulis* Bailey, in Gentes Herbarum **5**, 1 : 33, tab. 10 (1941), is merely *R. arcticus.* Since 1941 much new material of

R. paracaulis has come to hand, and there is to-day, in the National Herbarium of Canada, an impressive series of specimens from stations across Canada, from the Straits of Belle Isle to the foothills of the Canadian Rockies.

Bailey, l.c., states that *R. paracaulis* "sometimes suggests a hybrid between *R. acaulis* and *R. pubescens*." Further study is needed to settle this question, but its fertility, distribution, and general appearance do not really suggest such hybrid origin. The fact that *R. paracaulis* normally has well-developed runners, sometimes more than one metre long, certainly shows that it is not *R. arcticus*, which all authors agree has no runners or stolons. From *R. alaskensis* it differs, *inter alia*, by its broad, oval stipules and much smaller flowers.

Rubus Chamaemorus L.; Hult., Fl. Al. and Yukon **6** : 997 (1946).

Nisutlin River Valley, in a muskeg bog east of Mile 42, No. 10819; lower Lapie Crossing, in a muskeg near Mile 132, Nos. 9582 and 9960.

A common or even ubiquitous species of cool, moist woods and alpine places throughout the Yukon; along the Canol Road very common in the black spruce muskegs of the northern part of our area where it was noted from all stations north of Pelly River; on the other hand, the species was rare to local in the calcareous Pelly Mountains.

At Lapie Crossing *R. Chamaemorus* flowered early in June and on June 27 had immature fruits. Early in August "bake-apples" were fully ripe and very plentiful on Mount Sheldon where the species ascends to 4,200 feet.

Rubus pedatus J. E. Smith; Hult., Fl. Al. and Yukon **6** : 1002 (1946).

In Yukon collected once at Lake Bennett, Macoun, Can, No. 58471.

Rubus stellatus J. E. Smith; Hult., Fl. Al. and Yukon **6** : 1005 (1946).

Upper Rose River, steep west slope of granite range east of Mile 95, in dry creek bed, elevation 5,000 feet, No. 10513; same place, alpine herbmats above timber-line west of Mile 95, elevation 5,000 feet, No. 11941; northeast shoulder of Mount Sheldon, near timber-line, No. 11081. Also Mayo District, June 20, 1927, Mrs. Geo. Black, and southwest Yukon, Haines Road, Mile 85, Clarke, No. 503.

Rubus stellatus appears to be rare and local in the Yukon. At all three stations along the Canol Road it grew above timber-line in alpine meadows where it undoubtedly has long been isolated. Our specimens flowered on July 17 and August 13; at Mile 95 a few last year's fruits were noted.

For a discussion of its relationship to *R. arcticus* and *R. alaskensis*, see under those species.

Rubus strigosus Michx. *See* Bailey in Gentes Herbarum **5**, 10 : 861-875, tab. 403 (1945).

R. idaeus ssp. *sachalinensis* (Lévl.) Focke; Hult., Fl. Al. and Yukon **6** : 1000 (1945).

Upper Rose River, steep rock talus east of Mile 95, No. 10514, Rose-Lapie Pass, rocky slopes east of Mile 105, elevation 5,000 feet, No. 10916 (both pink-flowered); rocky talus east of Mile 116, No. 10068; lower Lapie Crossing, dry slopes near Mile 132, No. 9519; same place open rocky woods near timber-line on mountain south of Mile 132, No. 9621; same place, in rich poplar woods, No. 9838; dry, shaly slopes west of road, No. 9867; Ross Valley, rocky ledges and cliffs at base of Mount Sheldon, No. 11564; Mount Sheldon, in ravines on lower southeast slope, near Mile 222, elevation 4,000 feet, No. 11726.

Occasional to common throughout the Yukon on rocky and sunny slopes or cliffs from the lowland ascending to 5,000 feet; along the Canol Road not seen north of Mount Sheldon.

Rubus strigosus varies comparatively little in our area. Pink-flowered specimens were noted on Rose River; in No. 10514, pink and white flowers even appeared on the same cane. In No. 9838 some of the primocanes bore 7-nate leaves. It flowers comparatively late, on Rose River from mid-July, but on Mount Sheldon fully mature fruits were nevertheless collected on August 3. The fruits were juicy and well flavoured.

Fragaria glauca (S. Wats.) Rydb.; Hult., Fl. Al. and Yukon **6** : 1008 (1946), in part.

Johnson Crossing, M. P. and R. T. Porsild, No. 562; alluvial flats west of Nisutlin River, near Mile 36, No. 10822; flood-plain of upper Rose River, near Mile 95, No. 10384. Also Mayo District: Anderson, No. 9778, and southwest Yukon, Alaska Highway, Mile 970, Anderson and Brown, No. 10008.

A common species on flood-plains of Nisutlin and Rose Rivers but not seen north of Mile 95. In the latter place, flowering specimens were collected on July 14, and, in the former, flowers and maturing fruits were noted on July 23. A Cordilleran species which extends into southeast Yukon north to Mayo and along Mackenzie River to the Arctic Circle. The writer has seen no authentic material from Alaska.

Fragaria yukonensis Rydb. in N. Am. Fl. **22** : 364 (1908).

F. glauca Hult., Fl. Al. and Yukon **6** : 1008 (1945), in part.

Whitehorse, on dry river-banks and slopes east of Lewes River, No. 9183; lower Lapie Crossing, Mile 132, gravelly flood-plain, No. 9273; dry, shaly lower slopes of mountain west of road, Nos. 9445, 9446, and 9472. Also noted on dry slopes of Pelly Valley.

On Lapie River where this species was dominant on dry, shaly slopes, two forms occurred; one with large and one with small flowers, but otherwise indistinguishable. Numbers 9472 and 9445 have flowers about 1·0 cm. in diameter, whereas in the rest the flowers are 2·0 cm. in diameter.

Hultén, l.c., reduces *F. yukonensis* to synonymy, stating that "he can see no difference between Yukon specimens of this type and F. glauca." This statement is difficult to understand because he examined and actually cited the type and several other collections of typical *F. yukonensis*.

As correctly described by Rydberg, the leaves, in that species, are thick and firm; so much so that Britton & Rydberg in Bull. N.Y. Bot. Gard. **2**, 6 : 174 (1901) misidentified it with *F. chiloensis*. Also, the thick, silky pubescence of the strongly veined underside of the leaves persists and is present even on last year's dead leaves, whereas in *F. glauca* the underside of the leaves is glabrescent. Likewise, the stout, flowering peduncles, as well as the calyces, in *F. yukonensis* retain their pubescence, whereas those of *F. glauca* are glabrescent in age.

Fragaria yukonensis flowered during the first week of June. When we visited Lapie Crossing again in late July, the fruits were all gone.

Fragaria yukonensis apparently is endemic to the central Yukon basin, extending from the upper Yukon and its tributaries at least to Manly Hot Springs, Alaska, Anderson, No. 7094.

Potentilla Anserina L.; Hult., Fl. Al. and Yukon **6** : 1011 (1946).

Apparently common along the Yukon where it was reported by Hultén, l.c. Recently collected in southwest Yukon along the Alaska Highway, Mile 945, Anderson and Brown, No. 10344.

Potentilla arguta Pursh ssp. **Convallaria** (Rydb.) Keck, in Carnegie Inst. Wash. Publ. **520** : 39 (1940).

P. arguta Hult., Fl. Al. and Yukon **6** : 1012 (1946).

Whitehorse, rare on dry slopes east of Lewes River, No. 10674; same place, M. P. and R. T. Porsild, No. 77; Haines Road, junction with Alaska Highway, Clarke, No. 333; Haines Road, boundary, M. P. and R. T. Porsild, No. 139.

In the National Herbarium of Canada is a fruiting specimen collected at Whitehorse by John Macoun, August 30, 1902 (Can, No. 58460), which Rydberg named *Drymocallis* [*Potentilla*] *corymbosa* but, for some unknown reason, did not include in the range given by him in N. Am. Fl. **22** : 369 (1908) for that species. I can see no significant differences between Rydberg's *Drymocallis* [*Potentilla*] *corymbosa* and *D. convallaria*. In the Canadian collection, Rydberg apparently applied the former name to more mature, glabrescent specimens. Our specimens in all respects match material from the Canadian Rockies; they had mature fruits on July 28.

Potentilla biennis Greene, Fl. Fran. **1**: 65 (1891).

In the National Herbarium of Canada are two typical specimens of this species, from Dawson district, Yukon, collected by John Macoun: "Summit of hill, Dawson, Aug. 8, 1902" and "On the hill by the Klondike River near Dawson, July 11, 1902," (Nos. 58458 and 58459, Can). The first is in fruit; the second is in anthesis. On the label of the latter Macoun wrote: "strong-scented."

Annotations on the labels show that Rydberg made the determinations; it is strange, therefore, that he did not include Yukon in the range given in N. Am. Fl. **22** : 306 (1908). Hultén, l.c., likewise, does not include *P. biennis* in the Flora of Alaska and Yukon. The species undoubtedly is introduced.

Potentilla biflora Willd. in Schlecht. in Ges. Naturf. Fr. Berlin Mag. **7** : 297 (1815).

Southwest Yukon: Alaska Highway, at White River, Anderson and Brown No. 10308; Kluane Lake, elevation 6,000 to 7,000 feet, Clarke, No. 254; Alaska-Yukon boundary, latitude 62 degrees N., Cairnes, Can, No. 85874.

The present series extends the known range of this Asiatic species to southwest Yukon. It was common on the east slope of Mackenzie Mountains along the Canol Road and probably occurs elsewhere at high altitudes in Mackenzie Mountains and possibly also in Ogilvie Mountains.

In the National Herbarium of Canada is a single collection from northern British Columbia where it was collected on the Alaska Highway at Mile 104 north of Nelson at 5,000 feet elevation, A. L. Rand, No. 38.

Potentilla diversifolia Lehm. var. **genuina** Wolf in Bibl. Bot. 16, No. **71** : 501 (1908).

P. diversifolia Hult., Fl. Al. and Yukon **6** : 1013 (1946), in part.

Pass between Teslin and Nisutlin Rivers, in subalpine meadow near Mile 14, No. 10997; upper Rose River, alpine meadows on mountain west of Mile 95, elevation 5,600 feet, Nos. 10515 and 10570; same place, steep slope east of Mile 95, No. 10516; Rose-Lapie Pass, alpine, grassy slopes on mountain east of Mile 105, elevation 5,000 feet, No. 10915. Also from Haines Road, Mile 85, B.C., Clarke, No. 498.

Two apparently distinct varieties of *P. diversifolia* occur in our area. One, always with digitate leaves, is the var. *glaucophylla*; the other, marked by consistently sub-pinnate leaves and persistent appressed silky-villous pubescence on the underside of the leaves and on the petioles and by large flowers, the writer takes to be var. *genuina* Wolf. The Yukon plant is consistently taller than that of the Rocky Mountains and has larger and paler flowers with petals 1·0 to 1·5 cm. long. Along the Canol Road this plant apparently is restricted to alpine slopes of Pelly Range where it flowered late. Our specimens are vigorous, often 30 cm. tall, with dark green but not glaucous leaves.

Potentilla diversifolia Lehm. var. **glaucophylla** Lehm. Stirp. Pug. **9** : 44 (1851).

P. diversifolia Hult., Fl. Al. and Yukon **6** : 1013 (1946), in part.

Whitehorse, along Miles Canyon, M. P. and R. T. Porsild, No. 10; upper Rose River, steep west slope of mountain east of Mile 95, No. 10517; same place, in a flood-plain meadow, No. 10540; Rose-Lapie Pass, on edge of snowflushes near Mile 102, Nos. 9362 and 10624; alpine slopes of mountain east of Mile 105, elevation 5,500 feet, Nos. 9372 and 9804; alpine upper slope of mountain west of Mile 116, No. 10071; lower Lapie River crossing, lower, shaly slopes of mountain west of Mile 132, No. 9727; south shoulder of Mount Sheldon, grassy slopes above timber-line, elevation 4,500 feet, No. 11620. Noted as common or even ubiquitous on dry, grassy slopes near and above timber-line, probably always on calcareous soil. Also Haines Road, Mile 85, B.C., Clarke, No. 499; Alaska Highway Mile 1016, M. P. and R. T. Porsild, No. 136.

The var. *glaucophylla* flowers almost a month earlier than var. *genuina* and is less hirsute and more glaucous. The basal leaves are from 5 to 7 cm. long, the blade always digitate, usually with 5, less commonly 6 or 7, cuneate leaflets, coarsely toothed above the middle. The leaves are glabrous and glaucous above, paler beneath, sparsely appressed silky-villous on the prominent nerves and with a tuft of white hairs at the apex of each tooth; the petioles are soft, silky, pubescent in youth, glabrate in age; the stipules are large, papery, and edged with purple. The flowering stems are ascending, 25 to 30 cm. high, often red or purple on the side facing the light, finely appressed pubescent, glabrate in age, bearing 2 to 3 almost sessile and reduced leaves, each with a large, green stipule, and usually 3 flowers on long peduncles. The bractlets and sepals are green with long, white hairs and short glands along the edges. The expanded flowers are about 2·0 cm. in diameter, the petals emarginate about 0·8 to 1·0 cm. long, uniformly pale yellow, and the nectar glands prominent and purplish black. Styles are filiform, two to three times as long as the mature, smooth achenes.

At Lapie Crossing, flowering specimens were noted on June 11 and fruiting ones on July 1. On Mount Sheldon it ascends to 6,000 feet.

Although monographers of the genus *Potentilla* have upheld *P. Ranunculus* Lge. in Fl. Dan., tab. 2964, a little known endemic of east and west Greenland (and, according to Fernald, from Ramah in northern Labrador),[1] that species differs from *P. diversifolia* var. *glaucophylla* only in being almost totally glabrous and slightly more glaucous. Rydberg, N. Am. Fl. **22** : 326 (1908), perhaps unduly influenced by the long, branching caudices shown in the beautiful plate in Flora Danica (l.c.), distinguished *P. Ranunculus* mainly by its "long, caespitose rootstock" as compared with a "short, woody caudex" in *P. glaucophylla.* In nature there is actually little or no difference in the caudices of these plants, and the Greenland plant might well be considered a geographic race: *P. diversifolia* ssp. *Ranunculus* (Lge.) n.comb. Another Greenland plant, *Potentilla rubella* Sör., in Gelting, Medd. om. Grl. **101**, 2 : 106-11, tab., 1-3 (1934), of which the writer has seen a duplicate of the type, differs from *P. diversifolia* ssp. *Ranunculus* chiefly in being slightly more pubescent and may thus be considered intermediate between ssp. *Ranunculus* and var. *glaucophylla.*

Potentilla elegans Cham. & Schlecht. in Linnaea **2** : 22 (1827).

Mount Sheldon, on rocky ledges and rock crevices above timber-line on south shoulder, elevation 6,000 feet, No. 11623; in rock crevices on steep cliffs on southeast corner below summit, elevation 6,500 feet, No. 11746; northwest end of Itsi Range, alpine slope at base of scree, elevation 5,500 feet, No. 11389.

This tiny Asiatic species, the American range of which simulates that of *P. biflora* Willd., was only recently recorded from Canada (Mackenzie Mountains, N.W.T., Porsild, Nat. Museum, Canada, Bull **101**, 1945). The present two Yukon stations fill a gap between Mackenzie Mountains and its only two other known North American stations: Porcupine Dome, central Alaska; and Seward Peninsula. In our area *P. elegans* grows on high alpine peaks where it must have been isolated for a long time.

Our specimens had mature fruits on August 7, when the leaves had already turned a bright red. The plant forms small, loose cushions, 2 to 15 cm. in diameter, from a much branched caudex. The leaves, including petiole, are 2 to 3 cm. long, and the naked fruiting peduncles barely exceed the leaves. On August 11, next year's flowering shoots were far advanced with fully visible flower-buds at the tip of the branches.

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[1] Fernald, Ottawa Nat. **13** : 102 (1899)

Potentilla emarginata Pursh, Fl. Am. Sept. **1** : 353 (1814).

Rose River valley, upper slope of granite mountain east of Mile 85-90, elevation 6,000 feet, No. 10180; alpine slopes west of Mile 95, No. 10217; rocky crest and summit, elevation 6,700 feet, No. 11940; south shoulder of Mount Sheldon, rocky ledges above timber-line, elevation 5,500 feet, No. 11621; upper south fork of Macmillan River, alpine slopes of shale mountain west of Mile 268, No. 11360. Also from Mayo District 63° 57′ N., 134° 25′ W., Bostock, No. 85.

An arctic-alpine species not previously recorded from Yukon, where it is restricted to high mountains. On Mount Sheldon ascending to 7,200 feet. In the Pelly Range flowering and fruiting specimens both were collected on July 6 and 9.

Potentilla fruticosa L.; Hult., Fl. Al. and Yukon **6** : 1017 (1946).

Rose-Lapie Pass, wooded slopes east of Mile 105, No. 9250; lower Lapie Crossing, in rich poplar woods near Mile 132, No. 9585.

A lowland species common throughout wooded parts of Yukon noted at all stations and in a variety of habitats but perhaps best developed in open muskegs. In the Pelly Range ascending to 6,000 feet. It flowered from first week of June and fruited abundantly wherever found.

Potentilla furcata Porsild, n.sp.

P. quinquefolia Rydb. in Mem. Dept. Bot., Columbia Univ. **2** : 76 (1898) as to plant illustrated on tab. 30, and description (in part), but not as to specimens cited; not *P. nivea* var. *pentaphylla* Lehm. Nov. Stirp. Pug. **9** : 69 (1851), nor *P. nivea* var. *subquinata* Lge. in Consp. Fl. Groenl. 9 (1880). (Plate XVIII, figures 1-4)

Caudex crassus pluriceps sublignosus, caudiculi residuis fuscis stipularum vestiti. Caules floriferi stricti vel e basi adscendentes 20-30 cm. longi, oligophylli, supra dichotome ramosi laxe paniculati pauciflori, sicut petioli et pedunculi parce tomentulosi et sparsim adpresso-pilosi. Folia radicalia digitata, plerumque 5-nata rarius 3-nata aut sub-pinnata jugis valde congestis, caulina supera ternata, floralia simplicia et reducta. Stipulae radicalium scariosae ferrugineae attenuatae integrae. Foliolis lanceolatis vel oblongis sub-pinnatifidis segmentis 7-9 linearibus acutis margine revolutis, terminali plerumque breve petiolato, supra parce adpresso-pilosis, sed mox glabratis, obscuro viridibus subtus prominenter nervosis parce griseo- vel albo-tomentulosis. Flores longe et graciliter pedunculati 6-10 mm lati. Calyx molliter adpresso-pilosus, sepala oblongo-acuminata, bracteae aequantes, petala obovata vix emarginata quam calyx parum longiora, flava. Discus staminifer pilosus. Receptalum villosum. Carpella laevia. Stylus subterminalis validus, basi glanduloso-incrassatus carpellum maturum subaequans.

Habitat and distribution: Dry, calcareous mountain slopes in Pelly range, with a single station in the Canadian Rockies.

The following series is rather uniform and does not resemble any species known to the writer:

Rose-Lapie Pass, dry, sandy slopes near Mile 102, elevation 3,600 feet, with flowers and almost mature fruits July 19, No. 10625 (type);

lower Lapie Crossing, dry, shaly slope near timber-line, west of Mile 132, elevation 5,000 feet, Nos. 9440, 9477, 9478, 9728, 9726; Pelly River valley, dry, sloping lake shore near Mile 136, No. 9892.

On Lapie River the species flowered abundantly in mid-June.

Potentilla furcata clearly belongs in the section MULTIFIDAE but superficially resembles certain 5-nate members of the section NIVEAE. Rydberg at least twice changed his mind about this plant, for in Bull. Torr. Bot. Cl. **28** : 181-2 (1901), in reducing *P. quinquefolia* to synonymy, he remarks: "When I changed *P. nivea pentaphylla* Lehm. to *P. nivea quinquefolia*, I did not know that it was identical with Lange's var. *subquinata*. From his description, especially from the words 'eleganter pinnatifidis' I was led to the supposition that it represented the quinate form of var. *Altaica*. As Lange's name is older than mine, it should be adopted. I am well satisfied with the change, as my own as a specific name is a misnomer." Following which, Rydberg cites a number of Greenland specimens of *P. nivea* var. *subquinata* Lge. But in N. Am. Fl. **22**, 4 : 330 (1908) he again reinstated *P. quinquefolia* and, presumably, by a *lapsus calami*, under its synonymy cited Bull. Torr. Bot. Cl., l.c. (but not *P. nivea* var. *subquinata* Lge. which he now placed under *P. nipharga* Rydb., l.c., p. 332) and also *P. nivea* var. *pentaphylla* Lehm. Although he obviously intended to show that *P. quinquefolia* was quite distinct from Lange's plant, Rydberg thus failed to disassociate it from *P. nivea pentaphylla*.

In the National Herbarium of Canada, Rydberg annotated a number of plants from the Canadian Rockies as *P. nivea* var. *quinquefolia*. Among those cited in his monograph, l.c., and seen by the writer (John Macoun, Nos. 1459, 7294, and 1460), none actually is the true *P. nivea* var. *quinquefolia*, of which there is only a single sheet: lower Bow flats, National Park, Rocky Mountains, [Banff Park] July 1, 1891, John Macoun (Can, No. 7291). Rydberg's plate, tab. 30, l.c., is a good match for this and may actually have been drawn from this identical specimen or the New York Botanical Garden duplicate. It is of interest to notice that this plant had originally been named *P. gracilis* Doug. var. *fastigata* Nutt. It is significant, too, that Rydberg in N. Am. Fl. placed his *P. quinquefolia* in the section CONCINNAE rather than in NIVEAE.

Potentilla quinquefolia, unfortunately, is a *nomen confusum* and must be discarded.

Potentilla glabrella Rydb. in Mem. Dept. Bot., Columbia Univ. **2** : 94 (1898)

P. pennsylvanica var. *glabrata* Wats. in Proc. Am. Acad. **8** : 554 (1873); Hult., Fl. Al. and Yukon **6** : 1027 (1946), verisim.

Rose-Lapie Pass, in subalpine meadows and on grassy slopes near Mile 102, elevation 3,600 feet, No. 10626; Rose-Lapie Pass, rocky lower slope of mountain west of Mile 116, elevation 5,000 feet, No. 10069. Our specimens had flowers and mature fruits on July 19.

The entire plant is strongly glandular-glutinous, especially on the peduncles and calyces; so much so that numerous small insects, dust particles, and mature achenes firmly adhere to these parts. Otherwise the plant is totally glabrous; the coarsely serrate leaflets are fresh green on both surfaces, the styles slender but thickened at the base and approximately of the length of the achene.

Our specimens are a close match for Raup and Abbe, No. 4487, and Raup, No. 7035 (Can) from Athabasca Lake, which, by Raup, Journ. Arn. Arb. **17** : 268 (1936), were referred to *P. pectinata* Raf.

Potentilla gracilis Dougl. ssp. **Nuttallii** (Lehm.) Keck in Carnegie Inst. Wash. Publ. **520** : 134 (1940).

P. gracilis Hult., Fl. Al. and Yukon **6** : 1019 (1946).

Whitehorse, sandy banks of Lewes River, Nos. 9185 and 10673. Tall specimens with flowers and immature fruits on July 28-29. Two other numbers, Nos. 9187 and 9188, collected here on June 1, have almost glabrous basal leaves of a somewhat different cut. In Yukon previously collected at Dawson (Malte, Nos. 325 and 326) and at Whitehorse.

Potentilla Ledebouriana Porsild n. nomen. *See* Ostenfeld in Medd. om. Grl. **64** : 187 (1923).

P. uniflora Ledeb. in Mem. Acad. Sc. Petersb. **5** : 548 (1815); Hult. Fl. Al. and Yukon **6** : 1028 (1946).

Pass between Teslin and Nisutlin Rivers, rocky summit of mountain east of Mile 14, No. 10999; Rose-Lapie Pass, rock crevices on cliffs near summit of mountain east of Mile 105, elevation 6,000 feet, No. 11992; lower Lapie Crossing, rocky crest of mountain south of Mile 132, No. 9623; south shoulder of Mount Sheldon, rocky ridges, No. 11622. Also from Dawson Range, latitude 62° N. and 138° W., Bostock, Nos. 7 and 262; Haines Road, Mile 85, B.C., Clarke, No. 497; same place near boundary, M. P. and R. T. Porsild, No. 201; Alaska Highway, Mile 1136, Anderson and Brown, No. 10309. In Yukon previously recorded from Kluane Lake.

An arctic-alpine species which in our area is found only on high peaks where it flowers early in June and in Pelly Range had immature fruits on June 15.

Ostenfeld, l.c., has pointed out that *P. uniflora* Ledeb. cannot be retained, because Ledebour originally applied that name to a form of *P. nivea* from Dahuria where *P. uniflora*, as now understood, does not grow.

Potentilla Ledebouriana is a very critical species in arctic North America where in Alaska, it may be confused with forms of *P. villosa* and in the eastern Canadian Arctic with forms of *P. Vahliana* or *P. Pedersenii* (*P. rubricaulis* var. *arctica* Simm.). In the Canadian Rocky Mountains, on the other hand, it scarcely varies at all.

Potentilla nivea L. ssp. **fallax** Porsild, n.ssp.

P. nivea var. *altaica* Rydberg in Mem. Bot. Columb. Univ. **2** : 86 (1898), not *P. altaica* Bunge.

P. nipharga Rydb. in N. Am. Fl. 22, **4** : 332 (1908), pro min. parte.

(Plate XVII, figures 1, 2)

Caudex crassus multiceps caudiculis brevibus caespitose congestis. Caules floriferi validi sub-adscendentes 3-8 cm longi oligophylli, tomentoso-floccosi mox glabrescentibus. Folia radicalia ternata petiolis perbrevibus (foliolum aequantibus) tomentoso-floccosis, eorum stipulae scarioso-ferrugineae mox glabrescentes. Foliola oblongo-ovata, 5-8 mm longa, profunde incisa segmentis utrimque 2-3 lineari-lanceolata acuta supra sparce villosa subtus dense niveo-tomentosa et pilis longioribus subvillosis. Caules 1-3 flori, floribus minoribus, 8-14 mm latis pedunculis longis strictis. Calyx villosissimus, sepala deltoidea bracteas lineares aequantia. Petala quam sepala sesquilonga, obcordata, aurea. Receptaculum villosum. Carpella laevia, stylus subterminalis, filiformis valde curvatus, epappilosus, carpello maturo brevior; stigmate vix dilatato.

Lower Lapie crossing, lower shaly slopes of mountain west of Mile 132, elevation 4,000 to 5,000 feet, Nos. 9476 (type), 9474 and 9443; also Kluane Lake, elevation 6,000 to 7,000 feet, Clarke, No. 253.

At an elevation of 4,000 feet the species had mature fruits on June 14 and at 5,000 feet flowers and immature fruits on the same date. It forms large, loose cushions on dry, sunny, calcareous slopes.

The ssp. *fallax* does not match any of the described varieties or races of the polymorphous *P. nivea* and appears to have a well-defined geographical range. It is probably closest to *P. sino-nivea* Hultén, Bot. Not. 1945, p. 138, fig. 26, from which it differs, *inter alia*, by its shorter petioles, tomentose and villous underside of the leaves, 1- to 3-flowered stems, and smaller flowers.

Our specimens are a perfect match for a specimen in the National Herbarium of Canada, from "Crevices of rocks, alt. 8000′, mountains at Kicking Horse Lake [near Lake Louise, Alta.]" collected by John Macoun, August 18, 1890 (Can, No. 7333). In his monograph Rydberg (l.c., p. 86) considered this plant *P. nivea* var. *altaica*, although his annotation on the sheet in question merely says "approaching var. altaica," but in N. Am. Fl. p. 332, he referred it to his new *P. nipharga*. Our plant certainly bears no resemblance to *P. altaica* Bunge, as illustrated in Ledeb. Ic. Fl. Ross. tab. 329, nor to *P. nipharga* Rydb.

In 1945 the writer rediscovered ssp. *fallax* on high mountains of Banff Park, Alta.: Porsild and Breitung, Nos. 12570, 13435, and 13994, close to where Macoun collected it in 1890.

Potentilla nivea L. ssp. **Hookeriana** (Lehm.) Hiitonen in Arch. Soc. Zool. Bot. Fenn. Vanamo, **2** : 25 (1947).

P. Hookeriana Lehm. in Index Sem. Hort. Bot. Hamb. **16** : 10 (1849); Hult. in Bot. Not. pp. 138-140 (1945); idem, Fl. Al. and Yukon **6** : 1020 (1946).

P. nivea var. *Hookeriana* Th. Wolf, Mon. Potent., 240 (1908).

(Plate XVI, figures 1-3)

Whitehorse, dry, sandy plain east of Lewes River, Nos. 9184, 9189, and 10678; Rose-Lapie Pass, grassy slopes near Mile 102, No. 9363; dry, rocky lower slope of shale mountain east of Mile 105, No. 10914; lower Lapie Crossing, dry river terrace near Mile 132, No. 9520; same place, shaly slopes west of road, Nos. 9442, 9475, 9622 and 9729; Pelly River valley, vicinity of Ross trading-post, No. 9694; dry ridges near Mile 136, No. 9854. Also from Ogilvie Range, north fork of Klondike River, Cockfield, No. 35; Alaska Highway, Mile 1022, Anderson and Brown, No. 10047; Snag Air Station, June 11, 1944, G. A. Noel (Can); Kluane Lake, Clarke, No. 168, and Dawson District.

A lowland plant which, in Yukon and Mackenzie Districts, appears to be restricted to dry, calcareous soils. At Whitehorse it flowered on June 1 and on Pelly River had mature fruits on June 23.

Although its accuracy is questioned by Wolf, l.c., Lehmann's plate in Revis. Pot. tab. 55, is actually much better than is Rydberg's, l.c., tab. 33, and, *inter alia,* shows the spreading, long villous hairs over the thin tomentum of the petioles, so characteristic of ssp. *Hookeriana,* and described by Lehmann ". . . tomento denso pilisque longioribus patentibus . . .". Rydberg's plate shows a strigose, appressed type of pubescence on these organs which is not found in ssp. *Hookeriana.*

Wolf considered our plant a western American race: *P. nivea* var. *Hookeriana.* This view undoubtedly is correct. The writer has seen no typical *P. nivea* from either Alaska or Yukon, nor has Hultén, l.c., who only mentions a var. *tomentosa* Nilsson-Ehle which he reports from a single station in Yukon (actually in northern British Columbia). In eastern North America *P. Chamissonis* Hult., Bot. Not., 1945, p. 140 [*P. nivea* ssp. *Chamissonis* (Hult.) Hiit.] is the amphiatlantic counterpart of ssp. *Hookeriana. P. rubricaulis* and *P. villosa,* on the other hand, which, by Hiitonen, l.c., were likewise reduced to subspecies of *P. nivea,* in the writer's opinion are not even closely related to the *P. nivea* group.

Potentilla nivea L. var. **tomentosa** Nilsson-Ehle in Hult. in Bot. Not. 1945, p. 134; Hult., Fl. Al. and Yukon **6** : 1022 (1946).

Lower Lapie River crossing, on dry, shaly slopes of mountain west of road, flowering specimens on June 12, No. 9444.

A rather peculiar and perhaps distinct race which differs from typical *P. nivea* by its long, silky, white pubescence on the stipules, petioles, and on both leaf-surfaces. The var. *tomentosa,* which was first recorded by Hultén, l.c., from Llewellyn Glacier, B.C., near the Yukon border, July 15, 1914, Eastwood (US and G), has also been collected along the Alaska-Yukon boundary, latitude 65° 12′, Cairnes, No. 83055 (Can), and from the head of Chitina River, Alaska, Laing, No. 114 (Can).

Potentilla norvegica L., Sp. Pl. 499 (1753).

P. norvegica ssp. *monspeliensis* (L.) Asch. & Graeb.; Hult., Fl. Al. and Yukon **6** : 1022 (1946).

Johnson Crossing, M. P. and R. T. Porsild, Nos. 468 and 727; Rose-Lapie River pass, in subalpine meadows near Mile 102, No. 10627; lower Lapie River crossing, by a moose-lick near Mile 132, No. 9429; Pelly River valley, in wet, boggy places on lake shores near Mile 136, Nos. 9855 and 9891; Ross River valley, in meadows by north end of Sheldon Lake, Mile 222, No. 11562. Also at Mayo, Anderson, No. 9750, and from a number of places along Yukon Valley (Hultén).

A lowland species common in flood-plain meadows along the Canol Road.

As elsewhere, the species is variable. In the Canol Road collection, No. 10627 belongs to the almost glabrous and essentially smooth-fruited var. *labradorica* (Lehm.) Fern., whereas the rest are var. *hirsuta* (Michx.) Lehm., with strongly hirsute stems and petioles, and with rugose achenes. *P. norvegica* flowered on June 12 and a month later had mature fruits.

Potentilla palustris (L.) Scop.; Hult., Fl. Al. and Yukon **6** : 1025 (1946).

Pass between Teslin and Nisutlin Rivers, in wet bogs near Mile 14, No. 11142; alluvial flats along west bank of Nisutlin River, Mile 36, No. 10820; Rose River valley, in boggy places near Mile 77, No. 10301; Rose-Lapie Pass, in a wet meadow near Mile 98-99, No. 11907. Also from Mayo, Anderson, No. 9723; between Stewart and Macmillan Rivers, Bostock, No. 84; north fork of the Klondike River, Cockfield, No. 34, and elsewhere in Dawson District; Haines Road, Mile 85, B.C., Clarke, No. 500.

A lowland species noted as common in bogs and wet meadows in all places where collections were made. On Mount Sheldon and in Macmillan Pass ascending to 4,500 feet. A late-flowering species which, along the Canol Road, matures fruits only in favoured habitats.

Potentilla pennsylvanica L., Mant. 76 (1767).

P. pennsylvanica var. *strigosa* sensu Hult., Fl. Al. and Yukon **6** : 1027 (1946), not *P. strigosa* Pall. *See* Fernald in Rhod. **37** : 286-92 (1935).

Whitehorse, sandy banks of Lewes River, Nos. 9186 and 10679; lower Lapie Crossing, dry, shaly slopes west of Mile 132, No. 9866; Pelly River valley, dry, clay slopes near Mile 136, No. 9667; Ross River, clay terraces near Mile 150, No. 9699. Also from Alaska Highway, Mile 1016, M. P. and R. T. Porsild, No. 137; Kluane Lake, idem, No. 200; ibid., Anderson, No. 9446; White River, idem, No. 9534. In Yukon previously recorded from Yukon Valley.

A lowland species which, apparently, in our area, is mainly restricted to the Yukon and its tributaries where it grows on calcareous clay and shale banks. On Pelly River it flowered on June 16 and at Whitehorse had mature fruits on July 28. The series is remarkably uniform.

Fernald, l.c., has cleared up the confusion pertaining to the use of "var. *strigosa*" as erroneously applied by Pursh and others, maintaining that the northwestern plant, if considered taxonomically distinct, must be called *P. missourica* Hornem., not *P. strigosa* Pall., which is a purely Siberian species.

Potentilla pulchella R. Br. var. **gracilicaulis** Porsild in Sargentia **4** : 48 (1943).

P. pulchella Hult., Fl. Al. and Yukon **6** : 1028 (1946).

In the Yukon collected thus far only on the Arctic Coast, on Herschel Island (Porsild, l.c.).

Potentilla rubricaulis Lehm., Nov. Stirp. Pug. **2** : 11 (1830) et Rev. Pot. 68, tab. 30, 1856. *See* Porsild, Sargentia **4** : 49 (1943).

P. Vahliana sensu Ostenf. in Gjöa Exp. 52 (1909), not Lehm., at least in part; Hult., Fl. Al. and Yukon **6** : 1029 (1946), at least as regards the Yukon plant.

Rose-Lapie Pass, rocky upper slopes of granite mountain west of Mile 116, elevation 6,000 feet, No. 10070. In Yukon otherwise known only from the Arctic Coast: King Point, Godfred Hansen, June 21, 1906 (Can); same place, Porsild, No. 7185.

Our specimens are a close match for a series collected near the type locality on Great Bear Lake (A. E. and R. T. Porsild, Nos. 2774, 2774A, and 2909), except that the flowers are even larger, being 2·5 cm. in diameter; the individual petals are 1·0 to 1·2 cm. long, pale yellow, and with an orange spot on the claw. Wolf, l.c., p. 171, described the flowers of *P. rubricaulis*: "flores mediocres, 12-15 mm lati" or only half the diameter of ours.

The present collection extends the known range of this rare and little known species by almost 600 miles.

Potentilla villosa Pall. in Pursh, Fl. Am. Sept. **1** : 353 (1814).

Pass between Teslin and Nisutlin Rivers, on rocky summit of mountain east of Mile 14, elevation 6,000 feet, No. 10998.

Our specimens flowered on July 6 and have the large, pale yellow flowers and the very large, glabrous stipules, so characteristic of *P. villosa*. It is new to the flora of Yukon but common on the Pacific coast of Alaska.

Potentilla yukonensis Hult., Fl. Al. and Yukon **6** : 1033 (1945).

Argentina subarctica Rydb. in N. Am. Fl. **22** : 354 (1908), not *Potentilla subarctica* Rydb. l.c. p. 347.

Whitehorse, shelving river-banks east of Lewes River, No. 10677; ibid., M. P. and R. T. Porsild, No. 36; Pelly River valley, on clay hummocks by the shore of a lake near Mile 136, No. 9782. Also Alaska Highway, Haines Road junction, M. P. and R. T. Porsild, No. 140; ibid., Clarke, Nos. 335 and 336.

The Pelly River specimens flowered on June 21, and at Whitehorse this species had almost mature fruits on July 29.

An inland species which, apparently, is restricted to alluvial banks of present and former river systems. Common also along the Mackenzie and its tributaries almost to the Arctic Coast.

Sibbaldia procumbens L., Sp. Pl. 284 (1753).

Upper Rose River, alpine slopes east of Mile 77, No. 10954; gravelly river-flats near Mile 95, No. 10388; south shoulder of Mount Sheldon near timber-line, elevation 5,600 feet, No. 11618; upper south fork of Macmillan River, alpine slopes west of Mile 268, No. 11359. Also Mayo District, McQuesten River, Christie, No. 58.

An arctic-alpine species which was noted as occasional to common on snowflushes above timber-line and on river-flats between Teslin-Nisutlin Pass and Macmillan Pass. On the upper Rose River, fruiting abundantly on gravel bars in the river, on July 11.

The series is very uniform, and our specimens differ in no respect from typical *Sibbaldia procumbens*. The species is new to the flora of Yukon but was previously recorded from central Alaska and from the Mackenzie and Richardson Mountains and Bear Lake.

Chamaerhodos erecta (L.) Bunge ssp. **Nuttallii** (T. & G.) Hult., Fl. Al. and Yukon **6** : 1035 (1946).

Whitehorse, dry hillsides east of Lewes River, No. 10672; lower Lapie Crossing, lower shaly slopes of mountain west of Mile 132, Nos. 9441, 9479, and 9865. Also Alaska Highway, Mile 1022, Anderson and Brown, No. 10021; Kluane Lake, M. P. and R. T. Porsild, No. 157, and from Yukon Valley.

A lowland species which in our area is limited to dry, calcareous slopes along the upper Yukon and its tributaries. On Lapie River flowering specimens were obtained on June 12, and at Whitehorse mature fruits were noted on July 28.

Fernald, Rhod. **37** : 284, tab. 366, figs. 1-2 (1935), has separated var. *keweenawensis*, which is said to differ from typical *C. Nuttallii* by being consistently hispid as well as glandular. Our specimens are all strongly hispid, as are all other Canadian specimens in the National Herbarium of Canada as well as a specimen from Montana, Blankinship, No. 689.

Geum glaciale Adams; Hult., Fl. Al. and Yukon **6** : 1038 (1946).

In Yukon recorded from Runt Creek in Ogilvie Range and from Herschel Island on the Arctic Coast. The species was recently recorded from Richardson Mountains west of Mackenzie Delta and probably will be found elsewhere in northwest Yukon.

Geum macrophyllum Willd. ssp. **perincisum** (Rydb.) Hult., Fl. Al. and Yukon **6** : 1040 (1946).

Rose River valley, in pine and spruce bogs near Mile 77, No. 10303; Rose-Lapie Pass, in meadows near Mile 102, Nos. 9364 and 10623; lower Lapie Crossing, Mile 132, in a muskeg by the roadside No. 10037; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11481; south fork of Macmillan River, Mile 250, No. 11432. Also from Haines Junction, Clarke, No. 337, and from a number of places in Yukon Valley north to Dawson.

Noted as common in lowland meadows and in wet places in open forest north to Macmillan Pass. On Lapie River our specimens flowered on June 30, and in Rose-Lapie Pass fruiting specimens were noted on July 19. The series is remarkably uniform and shows no transition toward the species.

Geum Rossii (R. Br.)Sér.; Hult., Fl. Al. and Yukon **6** : 1041 (1946).

In Yukon previously known only from a few stations in Ogilvie Range. To those given by Hultén, l.c., should be added: Mountains north of McQuesten Lake, Christie, No. 60; Ladue River and Edward and Nelson Creeks, 63° 58′ N., 134° 30′ W., Bostock, Nos. 86 and 87.

Dryas alaskensis Porsild in Can. Field-Nat. **61** : 187 (1947) tab. 1, figs. 3-5, map fig. 4.

Dr. octopetala ssp. *Hookeriana* sensu Hult., Fl. Al. and Yukon **6** : 1046 (1946) non *Dr. Hookeriana* Juz.

Miller Creek, 64° N., 140° 50′ W., Cairnes, Can, No. 93320; Dawson, Eastwood, No. 372 (US, Arn.); Mayo, Ray Gulch, August 20, 1943, Bostock; Keno Hill, June 20-28, 1927, Mrs. Geo. Black; McQuesten Lake, Cockfield, Can, No. 97708; White River, Eaton, No. 1909 (US); Klotassin area, Cairnes, Can, No. 91884; Dawson Range, Bostock, No. 263; Cone Mountain, Cockfield, No. 32.

An alpine species of well-watered, gravelly flood-plains and erosion fans, rarely found in tundra or in rocky places. It is endemic to unglaciated parts of Alaska-Yukon, extending from Seward Peninsula east to Richardson Mountains west of Mackenzie Delta, and from Ogilvie Range south to St. Elias and Alaska Range. So far not found in the mountains of southeast Yukon, British Columbia, or Alberta.

Dryas crenulata Juz. in Bull. Jard. Bot. Princip. U.R.S.S. **28**: 325 (1929); Porsild in Can. Field-Nat. **61** : 190 (1947), tab. 2, fig. 3, map fig. 4.

Dr. octopetala Am. auctt. quoad pl., Al. and Yukon, pro min. pte.

Canol Road, Lapie River crossing, No. 9724; also mountains east of Little Atlin Lake, Raup and Correll, No. 11260 (Arn.); Dawson, 1916, Kusche (G); ibid., Eastwood, No. 119a (US, Arn.) and No. 317 (Can, Arn, US); Colorado Creek, Dawson, Can, No. 58448, and East Dawson, idem, Can, No. 58447; Hunker Creek, idem, Can, No. 58446; Arctic Coast west of Mackenzie Delta, Porsild, No. 7186.

Dryas crenulata in Alaska-Yukon, as well as in Asia, appears to be an alpine and inland species which in Yukon is known from about a dozen collections from southeast Yukon, central Yukon, and the Arctic Coast districts. In Mackenzie Delta it extends a short distance east into the Caribou Hills. By its crenulate leaf-margins it strongly simulates *Dr. octopetala* to which species nearly all Alaska-Yukon material has been referred previously, but the veins on the underside of the leaves, as well as the petioles and stipules, are entirely destitute of the stipitate glands or white-tufted hairs so distinctive of *Dr. octopetala*, *Dr. alaskensis*, or *Dr. punctata*.

Dryas Drummondii Richards; Hult., Fl. Al. and Yukon **6** : 1043 (1946). *See* Porsild, Can. Field-Nat. **61** : 182, map fig. 4 (1947).

Lower Lapie Crossing, dry, shaly slopes of mountain west of Mile 132, No. 9473; same place, gravelly river-flat, No. 9549; Pelly River valley, dry ridges near Mile 136, No. 9889.

In Yukon also known from Dawson district, Klondike River, Macoun, Can, No. 58445; southwest Yukon, Alaska Highway, Mile 970, Anderson and Brown, No. 10020; Kluane Lake, Anderson, No. 9381.

A flood-plain species which along the Canol Road is restricted to calcareous soils of lower Lapie and Pelly River valleys where it is best developed on river gravels and often is a dominant species. In such places single individuals, by continued radial growth, sometimes form circular patches 10 to 15 feet in diameter. The branches root, in time the centre dies, and the patch becomes annular.

The species flowered from the middle of June, and mature fruits were seen by the end of the month. The nodding, pale yellow flowers do not expand as in other species of *Dryas* and for that reason are not so conspicuous. The golden yellow and shiny, erect-fruiting heads on peduncles up to 25 cm. tall, on the other hand, are strikingly beautiful.

One or even two rudimentary flowers may sometimes develop from the upper bracts of the peduncle a short distance below the normally developed terminal flower (No. 9473). Compare Porsild, l.c.

Dryas integrifolia M. Vahl; Hult., Fl. Al. and Yukon **6** : 1044 (1946), in part. *See* Porsild in Can. Field-Nat. **61** : 188-189 (1947), map fig. 4.

Canol Road, Macmillan Pass, No. 11244. Also Kluane Lake, Clarke, Nos. 170 and 251; ibid., Raup, Nos. 12129 and 12547 (Arn.); Haines Road junction, idem, No. 12015 (Arn.); Bear Creek, idem, No. 11829 (Arn.); Alsek River, idem, No. 11889 (Arn.); Frances River, July 4, 1887, Dawson; Arctic Coast, Herschel Island, Can. Arct. Exp., No. 251; King Point, Godfred Hansen, Can, No. 80653.

In Yukon, *Dr. integrifolia* is an arctic-alpine species which thus far has been collected only in mountains of southwestern and eastern Yukon, from Kluane Lake east to Frances River, in the Macmillan Pass of the Mackenzie-Yukon Divide, and on the Arctic Coast. Thus far, the var. *canescens* has not been collected in North America west of the Mackenzie.

Dryas octopetala L. s.str.; *See* Porsild in Can. Field-Nat. **61** : 184-185 (1947), map fig. 4.

Canol Road, Rose-Lapie Pass, Nos. 9400 and 10139; lower Lapie Crossing, No. 9725; Mount Sheldon, No. 11619. Also Alaska-Yukon boundary 65° 58′ and 66° 18′ N., Cairnes, Nos. 28 and 27; Kluane Lake, Burwash Landing, 6,000 to 7,000 feet, Clarke, No. 250; Arctic Coast, along 141st Meridian, 1912, Jessup (US).

In Yukon, *Dr. octopetala* apparently is a rare arctic-alpine species which thus far has been collected only in high mountains along the 141st Meridian, at Kluane Lake, along the Canol Road in the Rose-Lapie Pass, on Mount Sheldon, and on the Arctic Coast.

Dryas punctata Juz. in Bull. Jard. Bot. Princip. U.R.S.S. **28** : 320 (1929). *See* Porsild in Can. Field-Nat. **61** : 185 (1947), tab. 1, figs. 6-7, map fig. 4.

Dr. octopetala ssp. *punctata* Hult., Fl. Al. and Yukon **6** : 1047 (1946), pro max. pte.

Dr. octopetala ssp. *Hookeriana* Hult., Fl. Al. and Yukon **6** : 1046 (1946), pro min. pte., not Juz.

Canol Road, upper Rose River, No. 10571. Also Mayo district, 63° 35′ N., 134° 20′ W., Bostock, No. 79; Klutan Glacier, head of White River, Cairnes, Can, No. 86060; Kluane Lake, Harris (Arn.); mountain slopes south of Haines junction, idem, No. 12035 (Arn.); mountains east of Little Atlin Lake, Raup and Correll, No. 11224 (Arn.); Arctic Coast west of Mackenzie Delta, Porsild, No. 7148.

In Alaska and Yukon *Dr. punctata* is an arctic-alpine species growing on rocky slopes and summits above timber-line. It is common in the Bering Sea region, becoming progressively less common toward the east, and throughout its North American range it appears to be confined to areas subjected only to local glaciation.

Dryas sylvatica (Hult.) Porsild in Can. Field-Nat. **61** : 191-192 (1947), tab. 2, figs. 1-2, map fig. 4.

Dr. integrifolia var. *sylvatica* Hult., in Sv. Bot. Tidskr. **30**, 3 : 527, fig. 2, b, c. (1936); idem, Fl. Al. and Yukon **6** : 1045 (1946).

Whitehorse, No. 9191; Canol Road, Lapie Crossing, Nos. 9274 and 9584; Pelly Valley, No. 9888. Also White River, Anderson, No. 9260; ibid., Eaton, No. 538954 (US); Kluane Lake, Anderson, No. 9382; ibid., Burwash Landing, Clarke, No. 171; Dawson Range, 62° 40′ N. and 138° W. Bostock, No. 289; Yukon River, Five Finger Rapids, Tarleton, No. 68 (US).

Dryas sylvatica is common in interior Alaska-Yukon where it is a lowland species usually growing in open spruce forest and on gravelly river terraces, and apparently always on calcareous soil. Where the ranges of *Dr. integrifolia* and *Dr. sylvatica* overlap, the former is always restricted to alpine peaks; whereas the latter is found only at low elevations.

Sanguisorba officinalis L.; Hult., Fl. Al. and Yukon **6** : 1051 (1946).

In Yukon recorded from several stations in the Yukon Valley (Hultén). Not seen by us along the Canol Road.

Sanguisorba sitchensis C. A. Mey.; Hult., Fl. Al. and Yukon **6** : 1052 (1946).

Pass between Teslin and Nisutlin Rivers, in a subalpine meadow, Mile 14, No. 11140; alluvial flats west of Nisutlin River, Mile 36, No. 10821 (sterile young plants only); upper Rose River, in meadow near Mile 77, No. 10302; in wet flood-plain meadows and willow thickets near Mile 95, No. 10385. In Yukon previously known only from Lake Bennett and upper Lewes River.

A Pacific Coast species not seen north of upper Rose River where in rich subalpine meadows it ascends to 5,600 feet, and flowered from mid-July. The flowers are very fragrant, somewhat reminiscent of flowering hawthorn.

Rosa acicularis Lindl.; Hult., Fl. Al. and Yukon **6** : 1054 (1946).

Whitehorse, river terraces east of Lewes River, No. 10675; Rose River valley, open pine woods near Mile 77, No. 10300; dry mountain slope east of Mile 85, No. 10179; upper Rose River, dry rocky slope near Mile 95, No. 10464; same place, in shady woods, No. 10465; same place, steep west slope, No. 10512; Rose-Lapie Pass, mountain slope east of Mile 105, No. 9399; lower Lapie Crossing, dry river terraces near Mile 132, No. 9548; Ross River valley, near Sheldon Lake, Mile 222, No. 11561.

A woodland species common throughout the wooded parts of Yukon and along the Canol Road noted north to Macmillan River. On Mount Sheldon it ascends to timber-line but is best developed in open spruce woods and on warm, sunny slopes. On the Lapie River roses were in full bloom on June 11, and almost fully ripe hips were noted on Mount Sheldon on August 8.

The series shows the usual range of variation from globular to bottle-shaped hips.

Rosa Woodsii Lindl., Ros. Monogr. 21 (1820).

Whitehorse, river terraces east of Lewes River, No. 10676, where specimens with flowers and young fruits were collected on July 28-29.

The species apparently has not been recorded previously from Yukon but in the Northwest is known from a single station in central Alaska (Circle Hot Springs, Anderson, No. 7556) and, besides, from adjacent Mackenzie and northern British Columbia.

LEGUMINOSAE

Trifolium hybridum L.; Hult., Fl. Al. and Yukon **7** : 1076 (1947).

Whitehorse, roadsides and waste places, No. 9198; Johnson Crossing, M. P. and R. T. Porsild, No. 757.

Apparently winter hardy at Whitehorse; when collected, last year's frost-killed flowers were still attached. Also known from Dawson district.

Trifolium pratense L.; Hult., Fl. Al. and Yukon **7** : 1077 (1947).

Whitehorse, by a logging road east of Lewes River, No. 9196; Johnson Crossing, M.P. and R. T. Porsild, No. 307. Apparently winter hardy, but, like the preceding, with last year's flowers killed by frost. Also collected at Dawson.

Trifolium repens L., Sp. Pl. 767 (1753).

Whitehorse, by logging road east of Lewes River, No. 9197; Johnson Crossing, M. P. and R. T. Porsild, No. 476. A common weed in settled parts of Yukon which, like the preceding, is winter hardy at Whitehorse.

Melilotus albus Desv.; Hult., Fl. Al. and Yukon **7** : 1075 (1947).

Canol Road, near Johnson Crossing, M. P. and R. T. Porsild, Nos. 328 and 732. Also collected at Mayo, Anderson, No. 9691.

Melilotus officinalis (L.) Lam., Fl. Fr. **2** : 594 (1778).

Johnson Crossing. roadsides, M. P. and R. T. Porsild, No. 731; alluvial flats west of Nisutlin River, which had been used as pasture for horses, near Mile 30, No. 10823. Flowering specimens on July 23. Also collected at Mayo, Anderson, No. 9727.

Lupinus arcticus Wats.; Hult., Fl. Al. and Yukon **7** : 1069 (1947).

L. nootkatensis var. *Kjellmanii* Ostf. in Gjöa Exp., p. 52 (1909). *See* Porsild in Rhod. **41** : 249 (1939).

L. borealis Heller in Muhlenbergia **8** : 82 (1910); C. P. Smith in Sp. Lupinorum 661 (1949).

L. yukonensis Greene in Leaflets **2** : 233 (1912); C. P. Smith in Sp. Lupinorum 661-2 (1949).

L. multifolius C. P. Smith in Sp. Lupinorum 660 (1949).

(Plate IX B)

Whitehorse, common on dry, pine-covered slopes east of Lewes River, No. 9194; Johnson Crossing, M. P. and R. T. Porsild, No. 493; pass between Teslin and Nisutlin Rivers, windswept mountain top east of Mile 10, elevation 6,000 feet, No. 11001 (a dwarfed pubescent form from exposed places); lower Lapie Crossing, open spruce woods near Mile 132, No. 9521; alpine tundra on north slope of mountain west of Mile 132, elevation 5,600 feet, No. 9734.

Besides these, the following Yukon specimens are in the National Herbarium of Canada: Whitehorse, July 9, 1902, Macoun, No. 58428; Lake Laberge, Cockfield, No. 38; Yukon River, Rink Rapids, July 9, 1902, Macoun, No. 54426 (isotype of *L. borealis,* the type of which is in

Herb., Nevada Agric. Exp. Sta. (according to Smith, l.c.), and also the isotype of *L. yukonensis*, the type of which is in Herb., Notre Dame Univ. (according to Smith, l.c.); Yukon River, Ingersoll Islands, Gorman, No. 992; Stewart River, Camsell, No. 67890; Hunker Creek, Macoun, No. 54427; Coffee Creek, Malte, No. 41; lower Klondike, Cockfield, No. 39; Dawson, Eastwood, Nos. 97 and 294; Yukon River, between Whitehorse and Eagle, June 30, 1936, E. and J. Lohbrunner; Mayo District, June 20 to 28, 1927, Mrs. Geo. Black; McQuesten area, latitude 63°–64° N. and longitude 136°–138° W., Campbell, Nos. 160, 281, 350, 553, 651, 652, 798, and 906; Kluane Lake, Burwash Landing, 6,000 to 7,000 feet elevation, Clarke, No. 285; same place, at lake level, Clarke, No. 173; south end of Kluane Lake, Anderson, No. 9449 (isotype of *L. multifolius*); Snag Air station, June 11, 1944, G. A. Noel. Arctic Coast: King Point, June-July, 1909, Godfred Hansen (isotype of *L. nootkatensis* var. *Kjellmanii*); Shingle Point, Can. Arct. Exp., No. 169; Herschel Island, Can. Arct. Exp., No. 205.

Occasional to common throughout Yukon north to the Arctic Coast, in alpine tundra near and above timber-line and occasionally in open lowland spruce forest. A very handsome species which flowers from early in June until the end of the month. The deep purplish blue spikes may be 15 cm. long. As elsewhere, *L. arcticus* in Yukon shows considerable variation in regard to the degree of pubescence on the stems and leaves, and the alpine plant usually is lower and more hirsute than that of the lowland but in Yukon never approaches *L. nootkatensis* (*See* Porsild, l.c.).

Lupinus Jacob-Andersoni C. P. Smith in Sp. Lupinorum 658 (1949).

?*L. sericeus* Hult., Fl. Al. and Yukon, 7 : 1074 (1947); Anderson, Fl. Alaska, 400 (1947).

L. Porsildianus C. P. Smith in Sp. Lupinorum 659 (1949).

Whitehorse, well-established colonies along railroad embankment, specimens in beginning anthesis on June 1 to 5, 1944, Porsild and Breitung, No. 9193 (type of *L. Porsildianus*); along railroad, flowering and fruiting specimens on July 29, 1944, Anderson, No. 9535 (isotype of *L. Jacob-Andersoni*); Mackintosh, Alaska Highway, Mile 1022, fruiting specimens on July 3, 1946, Anderson and Brown, No. 10022.

Our plant thus far has been collected only along railroad tracks and by roadsides. Although well established at Whitehorse, I strongly suspect that it is a recent introduction not native to Yukon. Our No. 9193 was collected early in June and is lower and more hirsute than is Anderson's No. 9535, collected two months later. Otherwise I can see no essential difference between the two plants. Since *L. Jacob-Andersoni* precedes *L. Porsildianus*, the former name should be applied if, indeed, no other is available.

Lupinus Kuschei Eastwood in Leafl. Western Bot. **3** : 170 (1942); C. P. Smith in Sp. Lupinorum 659 (1949).

Carcross, July 16, 1914, Eastwood (Cal, No. 62472); July 30, 1946, Anderson and Brown (both according to Smith, l.c.). I have seen no material of this plant which Smith, l.c., suggests may be identical with his *L. Jacob-Andersoni*.

Lupinus nootkatensis Donn in Sims. in Curtis's Bot. Mag. 32, tab. 1311 (1810).

Southeast Yukon, Haines Road, Mile 85, Clarke, No. 492. New to Yukon but previously recorded from adjacent parts of British Columbia and Alaska.

Astragalus aboriginorum Richards.; Hult., Fl. Al. and Yukon **7** : 1079 (1947), in part.

Whitehorse, common on sandy slopes east of Lewes River, Nos. 9200, 9201, and 10689; same place, M. P. and R. T. Porsild, No. 34; Rose-Lapie Pass, rocky slope near summit east of Mile 105, elevation 6,000 feet, No. 9375; lower Lapie River crossing, dry, shaly slope west of Mile 132, No. 9481. Also recorded from the upper Yukon Valley and southwest Yukon, Kluane Lake, Clarke, No. 174.

Apparently a calciphile which, in our area, is restricted to dry, shaly slopes. At Whitehorse the species flowered from late in May, on June 6 had flowers and immature legumes, and on July 28 had fully mature fruits.

In the present series, the stems and leaves of the young plant are hoary-canescent, but in age the indument becomes much thinner, more appressed, and the upper surface of the leaflets almost glabrous. In anthesis the inflorescence is dense, almost globular, but towards maturity the rhachis elongates very considerably. The pubescence of the calyx, which in youth is black, turns brown in age.

Astragalus alpinus L.; Hult., Fl. Al. and Yukon **7** : 1081 (1947).

Whitehorse, common on dry slopes east of Lewes River, No. 9202; Johnson Crossing, M. P. and R. T. Porsild, No. 563; pass between Teslin and Nisutlin Rivers, in alpine tundra meadow near Mile 14, No. 11143; upper Rose River, gravelly flood-plain near Mile 95, No. 10392; Rose-Lapie Pass, in open spruce woods near Mile 105, No. 9315; same place, in subalpine meadow, No. 9806; lower Lapie River, gravelly river-flats opposite Mile 127, No. 10021; dry, shaly slopes of mountain west of Mile 132, No. 9731; Pelly River valley, in turfy places by lake shore, Mile 136, No. 9856; Ross River valley, sandy west shore of Sheldon Lake, No. 11565; south shoulder of Mount Sheldon, rocky ledges and ravines, elevation 5,000 feet, Nos. 11748 and 11772. Also Mayo District, Ladue River, Bostock, No. 90; Snag Airport, Noel, No. 12488; Dawson District, Malte, No. 40.

The present series is remarkably uniform, and none of the members can be referred to ssp. *alaskanus* Hultén, l.c., p. 1082, distinguished from the species mainly by its taller growth, more elongated inflorescence of paler flowers with shorter keels and narrower wings.

Astragalus alpinus is common on flood-plains and on alpine slopes to timber-line but is rarely seen above 5,000 feet. It flowered on June 1 at Whitehorse and in Rose-Lapie Pass had almost mature fruits a month later.

Astragalus americanus (Hook.) Jones; Hult., Fl. Al. and Yukon **7** : 1085 (1947).

A. frigidus (*L.*) Bunge var. *americanus* (Hook.) Wats.

Whitehorse, shaly bluffs east of Lewes River, No. 10684; Johnson Crossing, M. P. and R. T. Porsild, Nos. 309 and 629; lower Lapie River crossing, in rich poplar woods near Mile 132, No. 9839.

A lowland species which apparently is common in Yukon Valley and in southwest Yukon, but which along the Canol Road is restricted to the most favoured habitats. On Lapie River it had not yet flowered on June 22 but at Whitehorse, one month later, had almost mature fruits.

Astragalus Collieri (Rydb.) Porsild in Sargentia **4** : 50 (1943).

Atelophragma Collieri Rydb. in Bull. Torr. Bot. Cl. **55** : 127 (1928).

Astragalus Macounii sensu Hult., Fl. Al. and Yukon **7** : 1088 (1947).

This rare and little known species thus far has been collected only a few times in central Alaska-Yukon, on Kobuk River in northwest Alaska, and on Bear Lake. If Hultén is correct, l.c., that *A. Collieri* cannot be satisfactorily separated from the Cordilleran *A. Macounii*, it is very strange that the latter, thus far, has not been collected in northern parts of Alberta and British Columbia or in the upper Mackenzie Basin. More ample material is needed before the taxonomic position of *A. Collieri*, *A. Funstonii*, and *A. Harringtonii* can be satisfactorily settled.

Astragalus eucosmus Robins.; Hult., Fl. Al. and Yukon **7** : 1086 (1947).

Alluvial flats along west bank of Nisutlin River, Mile 36, No. 10825; lower Lapie River, on gravelly flat near Mile 127, No. 10020. Also Alaska Highway at Haines Junction, M. P. and R. T. Porsild, No. 208 and at Mile 1098, Anderson and Brown, No. 10073. In Yukon otherwise known from Yukon Valley and from Mayo District.

Apparently a rare species along the Canol Road where it was seen only in the places mentioned. Number 10020 had flowers and immature fruits on June 23, and No. 10825 fully mature fruits a month later.

Astragalus goniatus Nutt. in T. & G. Fl. N. Am. **1**: 330 (1838).

Whitehorse, roadsides, Anderson, No. 9583. Probably a recent introduction which so far has not been collected elsewhere in the Yukon.

Astragalus linearis (Rydb.) Porsild in Rhod. **41** : 250 (1939).

Atelophragma lineare Rydb. in Bull. Torr. Bot. Cl. **40** : 50 (1913).

Astragalus aboriginorum sensu Hult., Fl. Al. and Yukon **7** : 1079 (1947), in part.

Although Hultén, l.c., maintains that *A. linearis* is "merely a mature phase of *A. aboriginorum*," the large series now in the National Herbarium of Canada, including flowering and fruiting material, differs so consistently from *A. aboriginorum* that I hesitate to accept Hultén's views.

In Yukon *A. linearis* is known from Whitehorse, Dry Gulch in the Yukon, and from the Alaska Highway near the Alaska border.

Astragalus nutzotinensis Rousseau in Contr. Lab. Bot., Univ. Montr. **24** : 14 (1933); Hult., Fl. Al. and Yukon **7** : 1088 (1947).

A rare species which, thus far, in the Yukon has been collected only twice in St. Elias Range. It superficially resembles *A. alpinus* but has larger flowers and sickle-shaped pods.

Astragalus striatus Nutt. in T. & G. Fl. N. Am. **1** : 330 (1838).

A. Tarletonis Rydb. in Bull. N.Y. Bot. Gard. **2** : 175 (1901).

A. agrestis Hult., Fl. Al. and Yukon **7** : 1081 (1947).

Pelly River valley, open forested slope near Mile 136, No. 9783; same place, dry aspen ridge, No. 9857. Our specimens flowered in mid-June.

In Yukon otherwise known only from the Yukon Valley (*A. Tarletonis*).

Astragalus tenellus Pursh; Hult., Fl. Al. and Yukon **7** : 1089 (1947).

Whitehorse, bluffs east of Lewes River, No. 10688; lower Lapie River crossing, in aspen thickets in ravines of shaly mountain slopes west of Mile 132, No. 9868. Also Alaska Highway, Mile 937, Anderson and Brown, No. 9999. In Yukon otherwise known from two stations in the Yukon Valley.

A late-flowering species which, at Lapie River, flowered on June 25 and at Whitehorse had flowers and young fruits on July 28-29.

Astragalus umbellatus Bunge; Hult., Fl. Al. and Yukon **7** : 1090 (1947).
A. frigidus (L.) Bunge var. *littoralis* (Hook.) Wats.

East slope of Rose River valley, in spruce bog near Mile 77, No. 10304; upper Rose River, gravelly flood-plain near Mile 95, No. 10393; Rose-Lapie Pass, grassy slope amongst willow, near Mile 105, Nos. 9251, 9316, and 9807; northeast shoulder of Mount Sheldon, by alpine brook, elevation 5,000 feet, No. 11084. Also noted on the south fork of Macmillan River. Also Mayo District, 63° 36′ N., 134° 37′ W., Bostock, No. 89; southwest Yukon, Dawson Range, Canadian Creek, Bostock, Nos. 8 and 264; Kluane Lake, 6,000 to 7,000 feet, Clarke, No. 260; Haines Road, near boundary, M. P. and R. T. Porsild, No. 210. In Yukon otherwise known from mountains along the Yukon Valley and from the Arctic Coast. The American range of this species has recently been extended from Alaska-Yukon to Mackenzie and Richardson Mountains of Northwest Territories.

An alpine species inhabiting moist, grassy slopes near and above timber-line; on Mount Sheldon ascending to 5,000 feet. In the Rose-Lapie Pass the species flowered on June 10 and on July 14 had almost mature fruits.

Astragalus viciifolius Hult. in Ark. f. Bot. **33B**, 1 : 1 (1946), fig. 1.

Whitehorse, sandy and shaly bluffs east of Lewes River, No. 10686; same place, along railroad track, Anderson and Brown, No. 9990; Rose-Lapie Pass, slide-rock slope east of Mile 118, No. 11918. Also Alaska Highway Mile 1021, Anderson and Brown, No. 10026.

In the Rose-Lapie Pass *A. viciifolius* had mature fruits toward the end of July. New to Yukon but previously known from two stations in central Alaska.

Astragalus Williamsii Rydb. in Bull. N.Y. Bot. Gard. **2** : 175 (1901); Hult., Fl. Al. and Yukon **7**:1091 (1947). (Plate XIX, figures 1-4)

Whitehorse, sandy bluffs east of Lewes River, Nos. 9199 and 10687; Pelly River valley, in open aspen woods near Mile 136, Nos. 9668 and 9894.

A rather striking species which appears to be endemic to central Alaska and Yukon; in Yukon previously known from the Yukon Valley and from southeast Yukon.

In the Pelly River valley *A. Williamsii* formed large, compact clumps in sandy and gravelly soil. The full-grown stems are 50 to 75 cm. high, ascending-erect from a very thick and woody caudex. In life the stems are slightly glutinous, and terete rather than 4-angled, with a few black and white hairs. The leaflets are somewhat fleshy, prominently 1-nerved, truncate or retuse, greyish green and glabrous on the underside, occasionally with a few appressed hairs, deep green and glabrous above, with minute grey dots.

The peduncles rise from the upper leaf-axils and toward maturity may be 20 cm. long. The inflorescence at first is compact but rapidly elongates. The corollas are about 1·5 cm. long, pale yellowish white except for the purple tip of the boat-shaped keel. At Whitehorse *A. Williamsii* flowered on June 7, and on the Pelly River flowers and almost mature pods were collected on June 25.

Astragalus yukonis M. E. Jones, Rev. Astrag. 89 (1923).

Alaska Highway, Haines Junction, M. P. and R. T. Porsild, No. 207, and apparently common in southwest Yukon where it has been collected frequently between the Alaska-Yukon border and Whitehorse.

An endemic species of similar distribution as the preceding but, unlike it, known also from the Mackenzie Basin. We did not see it on the Canol Road.

Oxytropis foliolosa Hook.; Hult., Fl. Al. and Yukon **7** : 1096 (1947).

O. deflexa Hult., l.c., 1094, pro min. pte.

River-banks and flood-plains along Nisutlin River, opposite Mile 36-42, No. 10824; Rose River valley, gravel bars in river near Mile 77, No. 10305; gravelly flood-plain near Mile 95, No. 10391; Rose-Lapie Pass, on flood-plain near Lapie Lake, Mile 105, No. 9339; on gravelly outwash plain, No. 9805; lower Lapie River, on gravel bars in river bed, near Mile 127, No. 10019; lower Lapie Crossing, open spruce forest near Mile 132, No. 9961. Also Kluane Lake, Anderson, No. 9519 (cited by Hultén, l.c., as *O. deflexa*) and from a single station in the Yukon Valley.

A common species on river gravel bars and flood-plains of the Pelly Range but not seen north of Pelly River where it flowered in mid-June and a month later had mature fruits.

Oxytropis glutinosa Porsild, n.sp.

O. leucantha sensu Hult., Fl. Al. and Yukon **7** : 1099 (1947), at least in part.

(Plates XX and XXIV, figure 2)

Acaulescens, caudice robustissimo, in speciminibus majoribus 2-3 cm crasso, complures caules breves foliiferos atque stipulis et foliorum rudimentis marcescentibus vestitos generante.—Folia 5-10 cm longa.—Foliola 15-25, saepius alternantia vel opposita vel sat frequenter 3-verticillata, supra glabra, subtus villosa vel subpubescentia, lineari-lanceolata, propter margines valde revolutos cymbiformia.—Rhachis petiolusque canaliculata glabra, vel pilis albis perpaucis sparsis et divaricantibus et, sicut foliola, ubique glanduloso-puncticulata.—Stipulae albae chartaceae, libera parte longe acuminata, vena prominente viridi, pilis longis albis ciliatae et ubique glanduloso-punctatae.—Scapi in anthesi 10-15 cm longi, modice longiores quam folia, superne dense villosi, inferne glabrati perspicue canaliculati et glandulosi.—Inflorescentia ca 4 cm longa, fructificans parum elongata, 10-13 floribus munita.—Bracteae lineares virides, calycis tubum superantes, ciliatae et dense verrucoso-glanduliferae.—Calyx in vivo 12 mm longus tubo cylindrico viridi-purpureo, dense villosa pilis longis griseis et albis intermixtis, dentibus subulatis tubi longitudinis $2/3$. Corolla magna 20 mm longa, in vivo rubro-purpurascens, siccando coerulea, basi lutescens. Legumina (praecedentis anni) nigro-pubescentia, 15 mm. longa, profunde sulcata et subito rostrata.

Yukon: lower Lapie River crossing, dry shaly slopes west of Mile 132, June 20, 1944, No. 9730 (type); dry alpine tundra at summit of mountain south of Mile 132, No. 9939. In addition the writer has seen specimens from a rocky mountainside near south end of Kluane Lake, Anderson, No. 9447 (distributed as *O. Maydelliana*), and a single collection from Alaska: Alaska Range, Castner Glacier, A. E. and R. T. Porsild, No. 495. The latter plant was distributed as *O. hudsonica*, and in Rhodora, **41** : 151 (1939), recorded under that name; Hultén, l.c., referred it to *O. leucantha* (*See* also under that species).

Our plant is perhaps most closely related to *O. viscida* Nutt. from which it differs by its much stouter root system and caudex, by its glandular but at least not prominently woolly stipules, and by its short, not elongating inflorescence of purple and larger flowers. (In Nuttall's very brief description, the flowers of *O. viscida* are said to be ochroleucous, whereas Rydberg in Flora of Rocky Mountains states that they are "violet, rarely white"). From *O. ixodes* Butters and Abbé, Rhod. **45** : 2 (1943), *O. glutinosa* differs by the same characters that set it off from *O. viscida* and by being much more glandular-verrucose. Finally, it differs from *O. hudsonica* by its long, subulate calyx teeth, densely villous scapes and calyces, and by its much larger flowers that, unlike those of *O. hudsonica*, are not scented.

Our plant in life is very glutinous, so much so that grains of sand and even small insects often are seen adhering to the calyx, stem, or leaves. In drying, the plant exudes a rather pleasant odour reminiscent of fresh quinces.

Oxytropis glutinosa is an alpine species so far known only from high mountains of Yukon and Alaska.

Oxytropis gracilis A. Nels.; Hult. Fl. Al. and Yukon **7** : 1097 (1947).

Lower Lapie crossing, open spruce woods near Mile 132, No. 9276; dry, shaly slopes west of road, Nos. 9447, 9448, and 9483. Also from Kluane Lake, Clarke, No. 175.

In Yukon otherwise recorded from a number of stations along the Yukon Valley.

The Yukon material is rather uniform; it differs from the plant which, in Sargentia **4** : 52 (1943), I treated as *O. campestris* (L) DC. by its dark pubescence of the calyx and legumes and by the always erect and slender, flowering and fruiting stems.

The following description is from live material from the Lapie River:

Caespitose from a stout tap-root ending in a much branched crown. Leaves much shorter than the scape, bearing 6 to 7 pairs of leaflets; these, appressed silky-villous on both sides. Stipules prominent, glabrous, the free part with prominent, forking, green veins, and long-ciliate but glandless margins. Scape 10 to 16 cm. long at time of anthesis, reddish green with finely appressed white hairs. Inflorescence 7 to 11 flowered, at first subcapitate but soon elongating; bracts very short. Calyx somewhat urceolate, about 8 mm. long, pale greenish with a sparse cover of short, black hairs mixed with long, villous white hairs; teeth triangular-subulate, one-third as long as the tube and conspicuously darker and more densely pubescent. Corolla sulphur-yellow, showy, twice as long as calyx. No legumes seen nor any from last year, as these are soon eaten by mountain sheep and by small rodents.

A strikingly handsome species, very common, or even dominant on dry, shaly slopes of Pelly Range, and on June 10-14 was in full bloom.

Oxytropis Huddelsonii Porsild, n.sp. (Plate XVII, figure 5)

Pulvinato-caespitosa, ramulis prostratis, iterato ramificata ex caudice robusto, residuis ± flexuosis stipularum et foliorum e compluribus annis obtectis.—Folia brevia, 2-3 cm longa, flexuosa, petiola rhachidesque obscure purpurascentia, pilis albis longis et adscendentibus sparse obtecta.—Stipulae albae et firmae, dorso glabrae, earum parte libera brevi obtuso-deltoidea, pilis villosis 2 mm longis ciliata. Foliola 7-9, 4-5 mm longa, valde involuta, subtus sparse, supra dense pilis longis albis tecta.—Pedunculi gracillimi 2-3 cm longi, modice albo-strigosi, uniflori.—Bracteae parvae obsoletae.—Calyx (speciminum maturorum fructificantium) turbinatus, 7 mm longus, pilis nigro-fuscis appressis et dentibus anguste deltoideis 2 mm longis.—Legumina sessilia unilocularia glaberrima purpurea, 12 mm longa, rostro tenui et abrupte hamato excepto.—Semina reniformia brunnea (fusca) 1·5 mm diametrantia.—Flores ignoti.

A rather remarkable plant, perhaps most closely related to *O. nigrescens* from which it differs by its glabrous, short legumes, purplish peduncles and pedicels and by its few and strongly involute leaflets. Superficially our plant resembles *O. revoluta* Ledeb. of Kamtchatka from which it is at once distinguished by its glabrous, sessile legumes and acuminate free part of the stipules.

Although I have seen only the one collection, which, moreover, lacks flowers, this plant differs so strikingly from all North American species of *Oxytropis* known to me that I think it best to describe it as new.

Type: Yukon, Golden Horn Mountain, south of Whitehorse, in lichen heath above timber-line, elevation 5,800 feet, July 29, 1944, C. W. Huddelson.

Oxytropis hyperborea Porsild in Sargentia **4** : 53 (1943), excl. pl. from Chitina River, Alaska (Laing, Nos. 134 and 135).

O. varians Hult., Fl. Al. and Yukon **7** : 1107 (1947) as regards plant of arctic coast of Yukon. (Plate XXI, figures 1, 2)

When describing *O. hyperborea*, the writer had seen no authentic material of *O. varians* Rydb., but, mislead by Rydberg's statement about the latter, in Bull. N.Y. Bot. Gard. **2** : 176 (1901): "Apparently related to *A*[*ragallus*] *Richardsonii* and *A. splendens*," he did not suspect a close relationship between his *O. hyperborea* and *O. varians*. Although Hultén, l.c., who had seen no authentic material, reduced *O. hyperborea* to synonymy, that species is, nevertheless, a well-marked species easily distinguished from *O. varians* in which the stipules are densely hirsute and the free part shorter and more obtuse, with large papillae along the margins. Also, in *O. varians* the scapes, calyces, and legumes are covered by a dense, hoary pubescence which completely obscures the fine black hairs beneath it. This conspicuous, hoary pubescence gives to the entire plant a superficial resemblance to *O. splendens* to which *O. hyperborea*, otherwise, bears no similarity.

Oxytropis hyperborea apparently is endemic to northwestern Mackenzie, the westernmost islands of the Arctic Archipelago, and the arctic coast of Yukon, Porsild, No. 7151.

Oxytropis leucantha (Pall.) Bunge; Hult., Fl. Al. and Yukon **7** : 1099 (1947), in part.

In the Yukon recorded only once, from White River near the Alaska border (Hultén).

The writer has seen no authentic material of North American *O. leucantha*, but two specimens in the National Herbarium of Canada: Glacier Bay, Alaska, Anderson, No. 760, and Fort Nelson, B.C., Anderson and Brown, No. 9839, match Bunge's description, l.c., except for the long beaks of the legumes, and differ from all other Yukon-Alaska species of *Oxytropis* by their broad, papery-white, glabrous but ciliate-margined stipules. These plants are very different from my No. 495 from Alaska Range (*See* under *O. glutinosa*) which Hultén, l.c., has referred to *O. leucantha*.

Oxytropis Maydelliana Trautv.; Hult., Fl. Al. and Yukon **7** : 1100 (1947).

Northeast shoulder of Mount Sheldon on rocky ledges above timberline, elevation 5,000 feet, No. 11085. Also from Kluane Lake, elevation 6,000 to 7,000 feet, Clarke, No. 256. In Yukon otherwise known from White River and from the Arctic Coast.

An arctic species which apparently is rare and isolated on high mountains of central Alaska and Yukon but common along the Arctic Coast. It was seen nowhere else on the Yukon part of Canol Road but was common in the limestone country east of Macmillan Pass. On Mount Sheldon the species was very localized, growing only on the northeast shoulder where it fruited abundantly on August 13.

Oxytropis pygmaea (Pall.)Fern. in Rhod. **30** : 153 (1928).

O. nigrescens ssp. *pygmaea* (Pall.) Hult., Fl. Al. and Yukon **7** : 1103 (1947).

Upper Rose River, alpine slopes and summits east of Mile 85-90, No. 10181; Rose-Lapie Pass, rocky summit of mountain east of Mile 105, Nos. 9373, 9374, and 10919; southwest slope west of Mile 116, No. 10073; lower Lapie Crossing, rocky summit south of Mile 132, Nos. 9421, 9624, and 9938; northeast shoulder of Mount Sheldon, elevation 6,000 feet, No. 11086. Also Mayo District 63°10′ N., 135° 55′ W., Bostock, No. 173; Dawson Range, 62° 35′ N., 138° 20′ W., idem, No. 265. In Yukon otherwise recorded from Lake Bennett, White River, and from the Alaska-Yukon boundary, 67 degrees N.

An arctic-alpine species which, along the Canol Road, is found only on the highest mountains, generally above timber-line, and in the Pelly Range ascends to 6,000 feet. It is a pronounced calciphile and prefers dry, shaly slopes and rocky places where it forms large, loose cushions which, in early June, are covered with rather showy purple flowers. Fully mature legumes are 3·0 cm. long and 0·8 cm. broad and were first noted, on the upper Rose River, on July 7. The legumes are "harvested" almost at once by chipmunks and by other small rodents and for this reason are often hard to find.

Oxytropis retrorsa Fern. var. **sericea** (T. & G.) Fern. in Rhod. **30** : 140 (1928).

O. deflexa Hult., Fl. Al. and Yukon **7** : 1094 (1947).

Whitehorse, dry, sandy slopes and river-banks east of Lewes River, Nos. 9205 and 10682; Johnson Crossing, M. P. and R. T. Porsild, No. 3080. In Yukon otherwise known from the Yukon Valley, Kluane Lake, and White River.

A southern species which apparently in Yukon-Alaska is limited to the Yukon Valley and its tributaries. Number 10682 had mature legumes on July 28.

Oxytropis Roaldii Ostf.; Hult., Fl. Al. and Yukon **7** : 1105 (1947). *See* also Porsild, Sargentia **4** : 51 (1943) under *O. arctica.*

A rare and little understood species which has long been known only from a single collection from the type locality: Herschel Island, but by Hultén, l.c., recently recorded also from the lower Porcupine River and from Seward Peninsula. As pointed out by the writer, l.c., *O. Roaldii* Ostf. and *O. coronaminis* Fern. should probably be considered high-grown forms of the little known *O. arctica* R.Br.

Oxytropis Scammaniana Hult. in Ark. f. Bot. **33** B. 1 : 4 (1946).

A small, high-alpine species recently described from mountains of central Alaska. In Yukon collected a few times near the Alaska boundary and at Kluane Lake, 6,000 to 7,000 feet elevation, Clarke, No. 257.

The species superficially resembles *O. pygmaea* and *O. podocarpa* but differs from the former by its shorter legumes and glabrous stipules, the free part of which is ovate or short-acuminate, and from the latter by its much smaller and less inflated legumes. Hultén, l.c., on phytogeographical grounds, suggests that the plant reported by me (Porsild, 1944) as *Oxytropis terrae-novae* Fern., from Mackenzie Mountains, along the Canol Road east of the Mackenzie-Yukon Divide, may actually be his *O. Scammaniana.* Although most of my specimens were somewhat overmature, they actually show little resemblance to *O. Scammaniana* and may represent an undescribed species related to *O. terrae-novae.*

Oxytropis sheldonensis Porsild, n.sp.

(Plates XXII and XXIV, figure 1)

Caespitosa, radice primaria robustissima, caudices multos aggregatos gerente.—Stipulae magnae chartaceae, albidae maculis purpureis, ubique glanduligerae, marginibus albociliatis, nervo viride prominente in mucronem abrupte acuminatum desinente.—Folia ascendentia-erecta, 5-10 cm longa; foliola 25-31, lanceolata, 8-10 mm longa, 2-3 mm lata, lacteviridia subtus albo-villosa, marginibus involutis, glutinosa vel viscida, sed glandulis visibilibus nullis.—Scapi ascendentes-erecti, 5-15 cm longi, plerumque folia parum excedentes (interdum scapi singuli longiores), robusti, evidenter striati, inferne purpurascentes, pilis albo-villosis divaricates et pubescentia nigra brevi et sparsa intermixta.—Inflorescentia subcapitata, maturitata parum vel interdum aliquantum elongata, floribus 4-10.—Bracteae magnae foliaceae, villoso-subverrucosae, calycem aequantes.—Calyx brevis turbinatus, tuba 5 mm longa, dense villosa pilis nigris albisque, dentibus 3 mm longis, subulatis sinubus latis hiantibus.—Corolla rosea, siccitate caerulea, ca 12 mm longa.—Legumina matura dense griseo-hirsuta, sed non glanduloso-verrucosa, 20 mm longa, subtus profunde sulcata, sensim in rostrum longum strictum et obscure-viride desinentia.—Semina reniformia fere circularia, fusco-viridia, 2 mm diametrantia.

Yukon: Mount Sheldon, on rocky granite ledges at or near summit opposite Mile 122, elevation 6,800 to 7,200 feet, August 11, 1944, Nos. 11750 (Type), and 11749.

Oxytropis sheldonensis is perhaps most closely related to *O. hudsonica* from which it is well marked, however, by its strong tap-root and caudices, glabrous stipules, stout scapes, the short turbinate calyx and filiform-subulate teeth, and by its large non-glandular legumes and larger seeds.

In life the entire plant is somewhat clammy or glutinous and, in drying, stains the drying paper. In mature, dried specimens only the stipules and bracts of the inflorescence have visible glands. Fruiting specimens of *O. sheldonensis* in habit strongly simulates *O. Maydelliana* from which it is at once distinguished by its papery-white and glutinous stipules.

Our specimens grew on rocky granite ledges at or slightly below the summit of Mount Sheldon at an elevation of between 6,800 and 7,200 feet and on August 11 had fully mature legumes. A single plant had a few flowering peduncles.

Oxytropis splendens Dougl.; Hult., Fl. Al. and Yukon **7** : 1107 (1947).

Whitehorse, occasional on dry, sandy slopes and bluffs east of Lewes River, Nos. 9203 and 10683; lower Lapie Crossing, lower slopes of shale mountain west of Mile 132, in open aspen copses in ravines, No. 9869. Also on Alaska Highway, Mile 1022, Anderson and Brown, No. 10049, and recorded from several places along the upper Yukon.

Apparently a rare, late-flowering lowland species noted only as stated above. The Lapie River specimens were in beginning anthesis on June 25, and at Whitehorse fruits were immature on July 28.

Oxytropis varians (Rydb.) Hult., Fl. Al. and Yukon **7** : 1107 (1947), pro max. pte.

Aragallus varians Rydb. in Bull. N.Y. Bot. Gard. **2** : 176 (1901).

Oxytropis hyperborea Porsild in Sargentia **4** : 53 (1943), quoad pl. Al. (Laing, Nos. 134-135).

Whitehorse, Ear Lake, M. P. and R. T. Porsild, No. 35; sandy and shaly bluffs and hillsides east of Lewes River, Nos. 9204 and 9206. Also Alaska Highway, Mile 1166, Anderson and Brown, No. 10088; south end of Kluane Lake, Anderson, No. 9364; White River, Anderson, No. 9285; Dawson District, Hunker Creek, Macoun, Can, Nos. 58441 and 58442. The type, Tarleton, No. 33b, came from Whitehorse.

Oxytropis varians appears to be a lowland species which is endemic to southern and central Yukon and to central Alaska. It belongs in a group of critical species with *O. hyperborea*, *O. gracilis*, *O. spicata*, *O. campestris*, and *O. saximontana*; in Yukon it possibly hybridizes with *O. gracilis*. It is undoubtedly close to *O. hyperborea* which, however, is amply distinct (*See* that species).

Oxytropis verruculosa Porsild n.sp.

O. viscida Hult., Fl. Al. and Yukon **7** : 1108 (1947), pro pl. Chitina River, Laing, Nos. 136 and 137, non Nutt.

O. hudsonica sensu Porsild, Rhod. **41** : 151 (1939), pro min. pte., non Greene.

(Plates XXIII and XXIV, figure 3)

Caespitosa caudice robustissimo et ramosissimo, in speciminibus majoribus diametrum 3·5 cm attingens, ramis in pulvinum densum discoideum congestis. Folia 10 cm longa ad apicem ramorum dense aggregata.—Foliola 15-25 opposita vel terminalia saepe subverticillata, 5-6 mm longa, lanceolata laeteviridia, supra parce strigosa, subtus glabrata et dense glandulari-verrucosa.—Rhachides petiolique profunde canaliculata, ubique pilis longis divaricatis et verrucis munita.—Stipulae chartaceae mediocres extus glabrae, earum libera parte deltoidea nervis prominentibus, distincte verrucosa et longe-ciliata.—Scapi pauci erecti, 5-12 cm longi, in anthesi folia vix superantes, dense villosi et verrucosi.—Inflorescentia 7-20 floribus munita, jam in anthesi elongata, 3-7 cm longa.—Bracteae subherbaceae ob glandes densas viridescenti-luteae, lineares, flores subaequantes.—Calyx sparse griseo-villosus, dense verrucosus, tubo 5 mm longo, dentibus subaequantibus.—Corolla 10 mm longa ochroleuca, in carina macula purpurea bilaterali instructa, aliquando siccando purpurea.—Legumina immatura 8 mm longa, sparse griseo-pubescentia, subito acuminata.—Semina matura desunt.

Rose-Lapie Pass, rocky ledges on dry slope west of Mile 116, elevation 5,000 feet, July 1, 1944, No. 10072 (type). In addition, known from one station in the St. Elias Range, Alaska: Head of Chitina River, H. M. Laing, Nos. 136 and 137 (Porsild, l.c., as *O. hudsonica*; Hult., l.c., as *O. viscida*).

The affinity of *O. verruculosa* is certainly with *O. viscida* and *O. viscidula* and, following Hultén's key, l.c. 1093, it would be referred to the latter species, although true *O. viscidula*, as the writer knows it in the Canadian Rockies, does not occur in Yukon-Alaska. Typical *O. viscidula* has purple flowers that dry purple; its inflorescence is short, almost capitate, few-flowered, and not elongating; the plant itself is much less robust, not so glutinous, and lacks the strongly developed caudices of *O. verruculosa*.

Oxytropis verruculosa differs from another Yukon plant, which is here tentatively considered a geographic race: *O. viscidula* ssp. *sulphurea*, by its enormously developed root system and thick caudex, by being more glutinous, by its smaller flowers and legumes and longer bracts. In the press *O. verruculosa* makes a complete, yellowish imprint on the drying papers, and when dry, the leaves are separated only with difficulty. In the Rose-Lapie Pass it flowered 2 weeks later than *O. viscidula* ssp. *sulphurea*.

Oxytropis viscida Nutt.; Hult., Fl. Al. and Yukon **7** : 1108 (1947), pro max. pte.

Whitehorse, foothills of mountain range 6 miles northeast of Lewes River, dry slopes, No. 10681; shaly bluffs east of Lewes River, No. 10685. Also Alaska Highway, White River, Anderson, No. 9261.

A southern foothill species which in Yukon perhaps is restricted to the Yukon Valley. In typical specimens the yellowish villous stipules are very conspicuous and at once distinguishes this species from *O. viscidula* and *O. verruculosa*.

Oxytropis viscidula (Rydb.) Tidestr. ssp. **sulphurea** Porsild, n.ssp.

Inflorescentia elongata; corolla 15 mm longa sulphurea in carina macula purpurea bilaterali instructa siccando albescens.

Rose-Lapie Pass, shaly cliffs by waterfall east of Lapie Lake, Mile 105, No. 10918 (Type); lower Lapie Crossing, dry shaly slopes west of Mile 132, Nos. 9482 and 9761; alpine treeless upper slopes of mountain south of Mile 132, elevation 5,000 feet, Nos. 9625 and 9937. In addition the writer has seen the following material from Alaska: Slana-Tok Highway, Anderson, No. 8686; Franklin, Fortymile, idem, No. 7297, and Wiseman, idem, No. 5994.

The following description is based upon live material from the Canol Road, Lapie Crossing:

Perennial with a strong tap-root with a much branched crown, the branches covered with the persistent stipules of former years; leaves 7 to 12 cm. long with 19 to 25 opposite, alternate or frequently sub-verticillata leaflets, these lanceolate, 5 to 7 mm. long, glabrate above, appressed-pubescent beneath, and glandular along the somewhat involute margins; rhachis and petiole sparingly verrucose and with spreading, rather stiff white hairs; stipules prominent, glabrous or with a few long, white hairs on the back, yellowish glandular-verrucose especially on the long-attenuate free part which bears conspicuous green veins and long, white cilia; scapes 15 to 25 (35) cm. long, greenish red with spreading white hairs, and strongly glutinous-verrucose throughout, in anthesis not much longer than the leaves, somewhat elongating in fruit; inflorescence open, 10- to 21-flowered, much elongated, and more or less interrupted in fruit; bracts green with a reddish spot at the base, as long as the calyx, densely verrucose and glutinous; calyx tube cylindrical about 5 mm. long, grey-villous, teeth subulate 2 to 3 mm. long, densely verrucose and villous;

corolla 15 mm. long, sulphur yellow, drying dirty white, with two prominent bilateral purple spots on the keel; legumes 12 mm. long, abruptly acuminate, completely 2-loculate, finely grey pubescent; seeds, brown.

Oxytropis viscidula ssp. *sulphurea* is common on dry, sunny, calcareous slopes of the Pelly Range but was not noted north of Pelly River. At Mile 132 it ascended to 5,600 feet and flowered on June 11; almost mature fruits were noted on July 19. In life the entire plant is glutinous-viscid and stains the drying paper. The flowers are not scented, but the entire plant, when fresh, emits a rather agreeable odour reminiscent of fresh apples.

Oxytropis viscidula ssp. *sulphurea* undoubtedly is a distinct geographical race and when more fully understood may prove amply distinct. Undoubtedly its affinity is with the Cordilleran *O. viscida* and *O. viscidula* and probably also with *O. hudsonica*, which from the Hudson Bay region extends westward to the Mackenzie.

Hedysarum alpinum L.; Porsild, Rhod. **41** : 253 (1939).

H. alpinum var. *grandiflorum* Rollins in Rhod. **42** : 223 (1940) only as regards western plants cited, probably not as to type.

H. alpinum ssp. *americanum* (Michx.) Fedtsch. var. *grandiflorum* Hultén, Fl. Al. and Yukon **7** : 1111 (1947), in part.

The following specimens of American *H. alpinum* are in the National Herbarium of Canada: ALASKA: Seward Peninsula, Bluff, A. E. and R. T. Porsild, No. 1261; Buckland River, idem, No. 1592; Alaska Range, Chitina River, Laing, Nos. 138 and 232. YUKON: Arctic Coast, between King and Kay Point. Porsild, Nos. 7152 and 7189; Herschel Island, 1893, Stringer; Can. Arct. Exp., No. 228a. BRITISH COLUMBIA: Mount Selwyn, Raup and Abbé, Nos. 3967 and 4091; ALBERTA: Ptarmigan Valley, Stewardson Brown, No. 410; Continental Divide, H. F. Lambart, No. 71.

Two rather poorly defined races of *Hedysarum alpinum* are found in Alaska-Yukon. The first, which is here tentatively identified with *H. alpinum* s. str., is a rather low-grown, rarely over 20 cm. high, arctic-alpine plant with large (15 mm. long or over) flowers in short racemes. The flowers are usually darker, spreading rather than pendulous, and the teeth of the calyx tend to be narrower and less deltoid than in the var. *americanum*. This clearly Siberian race in North America extends east from Bering Strait only to the Mackenzie (but not, as stated by Rollins, l.c., "across the north to Newfoundland") and occurs sporadically on high mountains of unglaciated parts of Alaska-Yukon south through mountains of British Columbia and Alberta to latitude 53 degrees North.

The var. *americanum* is boreal rather than arctic-alpine, usually 50 to 100 cm. high with small (less than 15 mm. long) flowers in a long raceme; the flowers are pale purple or pink and pendulous, and their calyx teeth are always broadly deltoid. This American race is widely distributed from Newfoundland and Labrador south to northern Maine and Vermont, north to Ungava Bay and across the Continent, following roughly the southern limit of the coniferous forest, to British Columbia and Alaska. In the Mackenzie Delta it reaches beyond the forest limit to the Arctic Coast. In Yukon-Alaska it is essentially a lowland species that is best developed in well-drained alluvial soils.

Where the two races occur together, intermediate forms are found, as for example on Seward Peninsula, Alaska, from where Hultén, l.c., cites Imruk Basin, Walpole, No. 1696 (US), both under *H. alpinum* ssp. *americanum* and under the var. *grandiflorum.* Nevertheless, the western plant is nearly always easily recognized in the field. On the Arctic Coast east of Mackenzie, var. *americanum* merely becomes dwarfed, but the flowers remain as in the more southern, high-grown plant.

Hedysarum alpinum L. var. **americanum** Michx., Fl. Bor.-Am. **2** : 74 (1803).

H. alpinum ssp. *americanum* Hult., Fl. Al. and Yukon **7** : 1109 (1947).

Upper Rose River, in sandy flood-plain meadows near Mile 95, No. 10390; lower Lapie River crossing, in open spruce woods and river-flats near Mile 132, Nos. 9275 and 9684; shaly slopes near timber-line of mountain west of Mile 132, No. 9733; in steep ravines near timber-line on southeast slope of Mount Sheldon, elevation 4,000 feet, No. 11747; grassy banks, south fork of Macmillan River, Mile 250, No. 1433.

In Yukon, a common and sometimes locally dominant species on well-watered flood-plains, which was noted by us from Whitehorse north to Macmillan Pass. It is essentially a lowland species and rarely ascends beyond timber-line. On sheltered river-banks and in open spruce forest it often forms extensive and almost pure colonies. The tuber-like processes of the strong rhizomes are edible and in late autumn are quite palatable when cooked. These tubers are eaten by bears and by a number of small rodents. On Lapie River the species flowered on June 10 and a month later had almost mature fruits.

Hedysarum Mackenzii Richards.; Hult., Fl. Al. and Yukon **7** : 1112 (1947).

Whitehorse, shaly bluffs east of Lewes River, Nos. 9195 and 10680; Rose-Lapie Pass, upper slopes of mountain west of Mile 118, elevation 5,500 feet, No. 10140; lower Lapie River, gravelly river-flats near Mile 127, No. 10022; dry shaly slopes west of Mile 132, Nos. 9480 and 9732.

In Yukon apparently a somewhat rare and local species previously known from several stations along the Yukon, besides from Mayo, Kluane Lake, White River, and Alaska Highway near Haines Junction. Along the Canol Road *H. Mackenzii* was restricted to calcareous soils derived from Palæozoic rocks of the Pelly Range and not noted by us between Pelly River and the Palæozoic rocks east of Macmillan Pass. It prefers dry, shaly, and sunny slopes and river-banks where the dense clumps of deep purple and sweet-scented flowers may be very conspicuous. It is essentially a lowland species which occasionally ascends to or near timber-line.

At Whitehorse it flowered on June 1 and on July 28 had fully mature fruits. The thick, fibrous roots are said to be poisonous.

Vicia cracca L., Sp. Pl. 735 (1753).

Specimens in beginning anthesis were collected at Dawson, August 9, 1916, Malte, No. 44.

Lathyrus japonicus Willd. var. **aleuticus** (Greene) Fern. in Rhod. **34** : 179 (1932).

L. maritimus Hult., Fl. Al. and Yukon **7** : 1115 (1947).

Besides several collections from Shingle Point on the Arctic Coast, there is in the National Herbarium of Canada a single inland collection from Keno, Mayo district, June 20-28, 1927, Mrs. Geo. Black. Possibly this otherwise littoral species was introduced there accidentally or perhaps cultivated in a garden.

Lathyrus ochroleucus Hook., Fl. Bor.-Am. **1**: 159 (1834).

Although as yet not recorded from the territory, this species may be expected to occur there as it has recently been collected at Liard Hot Springs and Fort Nelson on the Alaska Highway just across the British Columbia boundary.

Lathyrus palustris L. ssp. **pilosus** (Cham.) Hult., Fl. Aleut. Isl. 236 (1937).

Like the preceding, *L. palustris* ssp. *pilosus* has been collected along the Alaska Highway near the Yukon border.

GERANIACEAE

Geranium Bicknellii Britt.; Hult., Fl. Al. and Yukon **7** : 1119 (1947).

Alluvial flats along west bank of Nisutlin River, in open woods near Mile 36, No. 10827; Teslin Lake, M. P. Porsild, No. 310.

Apparently rare and seen nowhere else along the Canol Road. Our specimens had flowers and almost mature fruits on July 23. In Yukon, previously known from Dawson and from Whitehorse. In the latter place at least, the species is obviously introduced.

Geranium erianthum DC., Prodr. **1** : 641 (1824).

This Pacific coast species barely enters Yukon, having been collected only once, near the British Columbia–Yukon boundary, along Haines Road, M. P. and R. T. Porsild, No. 211.

Geranium Richardsonii Fisch. & Trautv., Ind. Sem. Hort. Petrop. **4** : 37 (1837).

Rose-Lapie Pass, in an alpine meadow above timber-line on mountain east of Mile 105, elevation 5,000 feet, No. 10920. Also Mayo District, McArthur Mountains, Hot Springs, Bostock, Nos. 176, 217, and 218; mountains north of McQuesten River, Christie, No. 66.

Our specimens are 60 cm. high and had flowers and immature fruits on July 21. This Cordilleran species was previously known north to the upper Peace River (Raup).

LINACEAE

Linum Lewisii Pursh, Fl. Am. Sept. **1** : 210 (1814).

L. perenne ssp. *Lewisii* (Pursh) Hult., Fl. Al. and Yukon **7** : 1122 (1947).

Whitehorse, dry river terraces east of Lewes River, No. 10691; lower Lapie Crossing, dry slopes and open forest near Mile 132, Nos. 9962 and 10044. In Yukon known also from Yukon Valley and Lake Kluane.

A lowland species common on dry, calcareous slopes in the Pelly Range but not noted along the Canol Road north of Pelly River.

Our specimens flowered at Lapie Crossing on June 20 and at Whitehorse had mature fruits and flowers on July 28.

CALLITRICACEAE

Callitriche anceps Fern. in Rhod. **10** : 51 (1908).

Pass between Teslin and Nisutlin Rivers, in a shallow pond, elevation 4,000 feet, No. 11146; Rose-Lapie Pass, in a small marly pond near Mile 98-99 with *Limosella aquatica*, Nos. 11908 and 11915.

Since the species was first described from Gaspé Peninsula, Quebec, it has been collected in Newfoundland, Straits of Belle Isle, the coast of Labrador, and in a number of places in west and east Greenland north to latitude 70° N. The present collections, as far as I know, are the first west of Gaspé. Our specimens from Rose-Lapie Pass had mature fruits on August 1.

Callitriche autumnalis L., Fl. Suec. 2 (1755).

C. hermaphroditica L.

Whitehorse, in 5 feet of water in Lewes River off the shipyard, No. 10690; Rose-Lapie River pass, in shallow pond with *Ranunculus aquatilis* var. *eradicatus* near Mile 98, No. 11993; in a shallow lake south of Sheldon Lake, No. 11571.

The Sheldon Lake specimens, which grew in a few feet of water, formed extensive and pure colonies and had almost mature fruits on August 8.

The species is new to the flora of Yukon.

Callitriche verna L. emend. Lönnroth.; Hult., Fl. Al. and Yukon **7** : 1123 (1947).

C. palustris Am. auth.

Johnson Crossing, M. P. Porsild, Nos. 400B, 614, and 723; in sheltered bay near north end of Sheldon Lake, Mile 222, No. 11570. In Yukon previously recorded from Whitehorse and from Dawson District.

Our specimens grew in shallow water on the muddy bottom of a sheltered bay and on August 1 had almost mature fruits.

EMPETRACEAE

Empetrum nigrum L.; Hult., Fl. Al. and Yukon **7** : 1124 (1947).

Whitehorse, in open pine forest east of Lewes River, No. 9208; Rose-Lapie Pass, in spruce bogs near Mile 105, No. 9318; lower Lapie River crossing, in a muskeg near Mile 132, No. 9551; Macmillan Pass, Mackenzie-Yukon Divide, Mile 284, No. 11251.

Although *E. nigrum* has been recorded from throughout the territory and was noted by us as common at all stations where collections were made, it nowhere is a dominant species; nothing at all approaching *Empetrum* heath was seen anywhere along the Canol Road where the species is mostly confined to black spruce muskegs, open lodge-pole pine forest on sandy places, and to timber-line alpine fir forest. On most mountains climbed, it ascends to the limit of the closed vegetation; thus, on Mount Sheldon *Empetrum* was not noted above 6,000 feet.

In nearly all specimens examined bisexual flowers were noted; our plant, thus, may be referred to var. *hermaphroditum* (Lge.) Sør.

VIOLACEAE

Viola adunca Sm.; Hult., Fl. Al. and Yukon **7** : 1131 (1947).

Whitehorse, shaly bluffs east of Lewes River, No. 10692; lower Lapie River crossing, lower slopes of mountain west of Mile 132, on grassy ridges, Nos. 9484, 9870, and 10045; lower Ross River, dry clay terraces, near Mile 150, No. 9701. Also Selkirk, Cockfield, No. 41. In Yukon previously known from a single station in Yukon Valley.

Viola adunca is a common species on dry, grassy, calcareous slopes in the Pelly Range north to Pelly River where the species flowers very early and on June 14 had matured fruits. It was not seen north of the Pelly.

Viola epipsila Ledeb. ssp. **repens** (Turcz.) Becker in Bot. Centralb. Beih. **34,** 2 : 406 (1917).

V. achyrophora Hult., Fl. Al. and Yukon **7** : 1130 (1947).

Rose River valley, Mile 77, in a wet meadow by a stream, No. 10308; same place, in a sphagnum bog, No. 10309; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11483. In addition, the following Yukon collections are in the National Herbarium of Canada: Mayo District, Anderson, No. 9692; same place, Bostock, No. 94; Dawson, Eldorado Creek, Tyrrell, Can, No. 59568; Eastwood, No. 291; Runt Creek, latitude 66° 17′, longitude 141°, D. D. Cairnes, Can, No. 81254.

Our specimens had flowered very early and on July 3 had matured fruits.

Viola Langsdorffii Fisch.; Hult., Fl. Al. and Yukon **7** : 1135 (1947).

In the National Herbarium of Canada are three collections from Yukon: Mayo District, McArthur Range at Hot Springs, Bostock, Nos. 219 and 174; Lake Bennett, Macoun, 58394. The species apparently is rare in the interior, and we did not see it along the Canol Road.

Viola renifolia Gray in Proc. Amer. Acad. **8** : 288 (1870).

Johnson Crossing, in border of wood, M. P. Porsild, Nos. 334 and 722.

The material which was collected on August 10 consists of only two fruiting plants. The petioles and under surface of the leaves are long-pubescent as in typical *V. renifolia.*

Viola renifolia Gray var. **Brainerdii** (Greene) Fern. in Rhod. **14** : 88 (1912).

In the mountains of southeastern Yukon the most common violet is a small, white-flowered, acaulescent species which, tentatively, is placed under *V. renifolia* var. *Brainerdii,* although it seems quite distinct from the eastern plant passing under that name. It is a perfect match for a plant found above timber-line in Banff Park.

The Yukon plant occurs in two phases, one strictly alpine with leaves 1·5 to 2·0 cm. in diameter, and the other essentially limited to the valley forest with twice as large leaves.

Both plants have rather stout vertical or ascending rootstocks and never form stolons. The leaves are reniform or orbicular, 1·5 to 4·0 cm.

broad and 1·0 to 3·0 cm. long, rather fleshy with subentire or slightly crenulate margins. The plant is totally glabrous except for an occasional sparse pubescence on the veins of the under surface of the leaf and the upper petiole. The petals are white, the three lower ones with deep purple veins, and all beardless. The seeds are large, about 2 mm. long, straw-coloured to pale brown, and smooth.

The first series represents the plant of moist woods and open muskegs:

Nisutlin River, marshy flats west of Mile 36, No. 10833; Quiet Lake, steep wooded slope near Mile 55, Nos. 11118 and 11119; Rose River valley, in pine bogs near Mile 77, Nos. 10306 and 10307; in flood-plain meadow near Mile 95, Nos. 10397 and 10466; Rose-Lapie Pass, outwash plain near Mile 105, No. 9808; southeast slope of Mount Sheldon, alpine slope above timber-line, elevation 5,000 feet, No. 11773.

The second series is that of the small-leaved plant found above timber-line:

Pass between Teslin and Nisutlin Rivers, alpine brook by a snowflush, elevation 5,500 feet, No. 11002; upper Rose River, by an alpine spring, elevation 5,000 feet, Nos. 10218 and 10572; Rose-Lapie Pass, alpine slopes of mountains east of Mile 105, Nos. 9376, 9377, 9377-A, 9402; alpine slopes west of Mile 116, No. 10075.

In Yukon *V. renifolia* var. *Brainerdii* flowered early in June and a month later had mature fruits.

Viola Selkirkii Pursh in Goldie in Edinb. Phil. Journ. **6** : 324 (1822).

Southeast slope of Mount Sheldon, elevation 4,500 feet, No. 11774.

Our specimens grew in deep leaf-mould in a dense alder and willow thicket; on August 17 a few over-mature capsules still remained. Apparently a rare species in the West where, otherwise, it is known only from a few stations in Alaska and British Columbia.

ELAEAGNACEAE

Shepherdia canadensis (L.) Nutt. ; Hult., Fl. Al. and Yukon **7** : 1138 (1947).

Whitehorse, river terraces east of Lewes River, No. 9207; Rose-Lapie Pass, in open spruce woods near Mile 105, Nos. 9319 and 9320.

A common or even ubiquitous species in open spruce forest and on outwash plains and gravel bars of the calcareous Pelly Range but not seen by us north of Pelly River.

Shepherdia flowered in Rose-Lapie Pass at 4,000 feet elevation on June 10 and on the Nisutlin River had fully mature fruits on July 23. The mature berry-like fruits are harvested by chipmunks (*Eutamias minimus*) which climb the bushes where they dexterously extract the seeds and discard the pulp.

Elaeagnus commutata Bernh.; Hult., Fl. Al. and Yukon **7** : 1139 (1947).

Apparently a rare and local species which in Yukon has been collected a few times in Yukon Valley, at Kluane Lake and at White River. It is strange that we did not see it in Pelly Range.

ONAGRACEAE

Epilobium anagallidifolium Lam., Dict. Encycl. **2** : 376 (1786).

Pass between Teslin and Nisutlin Rivers, alpine slopes near snowflush opposite Mile 14, elevation 5,500 feet, No. 11043; granite range west of upper Rose River, Mile 95, in rich alpine meadows, elevation 5,600 feet, No. 10574; in saddle between Mount Sheldon and Mount Riddell, in wet places by a brook, No. 11680; alpine slopes of mountain west of Mile 268 on Macmillan River, No. 11361; Macmillan Pass, Mackenzie-Yukon Divide, in alpine tundra near Mile 284, elevation 4,600 feet, No. 11247.

An arctic-alpine species not previously recorded from Yukon but recently reported from the Mackenzie Mountains (Porsild, 1945).

On Rose River our specimens flowered on July 15 and on Mount Sheldon had mature fruits on August 10. On Mount Sheldon the species ascends to 6,000 feet.

Epilobium angustifolium L.; Hult., Fl. Al. and Yukon **7** : 1143 (1947).

Upper Rose River, common in flood-plain meadows near Mile 95, No. 10394; lower Lapie Crossing, on river terraces near Mile 132, No. 9840 (var. *intermedium* (Wormskj.) Fern.).

A lowland species which was noted as common or even ubiquitous along the Canol Road on flood-plains, in open forests, and by river-banks; as elsewhere, it is one of the first species to invade roadsides and recent clearings. The var. *intermedium* is usually found at higher elevations and on Mount Sheldon ascends to 5,600 feet where it flowers two weeks earlier than the species. Both fruit abundantly where found.

Epilobium davuricum Fisch.; Hult., Fl. Al. and Yukon **7** : 1147 (1947).

Alluvial flats west of Nisutlin River, Mile 39, No. 10832; Rose River valley, in a pine bog near Mile 77, No. 10310; Rose-Lapie Pass, in subalpine meadow near Mile 98, No. 11909; lower Lapie River, in a muskeg in wet peaty soil along recent road clearing near Mile 132, No. 10039; Pelly River valley, among sedges by a lake near Mile 138, No. 9893. In Yukon previously known from Whitehorse and Dawson District.

A lowland species of wet places not seen north of Pelly River. It flowered from end of June and on Nisutlin River had mature fruits on July 23.

Epilobium glandulosum Lehm.; Hult., Fl. Al. and Yukon **7** : 1147 (1947).

By Hultén, l.c., recorded from Whitehorse.

Epilobium glandulosum Lehm. var. **adenocaulon** (Hausskn.) Fern. in Rhod. **20** : 35 (1918).

E. adenocaulon Hult., Fl. Al. and Yukon **7** : 1141 (1947).

Johnson Crossing, by edge of pond, M. P. Porsild, No. 471. In Yukon also known from Whitehorse, Dawson, and Mayo.

Epilobium glandulosum Lehm. var. **perplexans** (Trel.) Fern. in Rhod. **20** : 35 (1918).

E. adenocaulon var. ?*perplexans* Trel. in Mo. Bot. Gard., 2nd. Ann. Rept. 96 (1891), tab. 25.

In wet meadows west of Nisutlin River near Mile 36, No. 10831; lower Lapie Crossing, in freshly exposed wet, peaty soil by roadside, Mile 136, No. 10038; Pelly River valley, in wet sand by edge of slough, Mile 138, No. 11173.

Stems stiffly erect, dark purple, simple, or in tall specimens branched above, 15 to 60 cm. high, terete or very obscurely angled, glabrous below, short and sparsely pubescent above with short, glandless hairs; stem leaves 10 to 14 pairs, sessile or short-petioled, but never clasping, lanceolate, somewhat obtuse, gradually decreasing in size toward the inflorescence, the middle ones 2 to 3 cm. long, rather firm and ± tinged with purple, the margins minutely serrulate and with short and distinctly incurved, pale hairs; the innovations short and sessile; flowers 4 to 5 mm. long, rose-purple; mature capsules 4 to 5 cm. long, sparingly crisp pubescent; seeds striate and distinctly papillose; coma white.

The plant represented by the series cited above obviously is a very clear-cut entity that beautifully matches Trelease's plate (l.c.). It entirely lacks the multicellular hairs so characteristic of *E. glandulosum* var. *adenocaulon* and allies, and differs from all forms of *E. Bongardii* by its pure white coma.

Our plant was not seen north of the Pelly River where it flowered on July 7; on the Nisutlin River, flowering and fruiting specimens were collected on July 23.

Epilobium Hornemannii Reichenb.; Hult., Fl. Al. and Yukon **7** : 1149 (1947).

Pass between Teslin and Nisutlin Rivers, Mile 14, in wet moss by alpine brook, elevation 4,000 feet, No. 11145; mountain range west of upper Rose River, Mile 95, in wet moss by a brook, Nos. 10219 and 10573; steep west slope east of Mile 95, No. 10518; Ross River valley, in swampy places in muskeg near Sheldon Lake, Mile 222, No. 11567; upper south fork of Macmillan River, in wet gravel by alpine brook west of Mile 268, No. 11363. In Yukon previously known from a single collection from Whitehorse.

An arctic-alpine species, common above timber-line in wet moss by alpine brooks; in the Pelly Range ascending to 6,000 feet. In such places and near snowflushes, flowering specimens may be seen from mid-July until the end of August.

Epilobium lactiflorum Hausskn. in Oestr. Bot. Zeitsch. **29** : 89 (1879).

Upper Rose River in wet places on river-flat near Mile 95, No. 10396; same place, on outwash plain, No. 10442; northeast shoulder of Mount Sheldon, in moss by alpine brook, elevation 5,000 feet, No. 11088; south shoulder, in a ravine above timber-line, No. 11624; upper south fork of Macmillan River, by alpine brook on mountain west of Mile 268, No. 11362. Also noted in Macmillan Pass (Porsild, 1945). In the National Herbarium is an earlier specimen from Yukon: Mayo District, latitude 63° 35′, longitude 134°, Bostock, No. 93.

An arctic-alpine species of similar local distribution as the preceding, although not infrequently found also at lower altitudes. It flowers almost two weeks earlier than *E. Hornemannii* and in the Pelly Range had mature fruits above timber-line on July 14.

Epilobium latifolium L.; Hult., Fl. Al. and Yukon **7** : 1151 (1947).

Lower Lapie Crossing, Mile 132, on gravel bar in river, No. 9550.

A common or dominant species throughout the Yukon on gravel bars and on well-drained, sandy flood-plains. Noted everywhere along the Canol Road. On Mount Sheldon ascending to 6,000 feet. On Lapie River the species flowered from first week of June, but, in suitable places, flowering specimens could be found toward the end of July. The species fruits abundantly wherever found.

The young leaves are edible when cooked.

Epilobium palustre L.; Hult., Fl. Al. and Yukon **7** : 1155 (1947).

Pass between Teslin and Nisutlin Rivers, in subalpine meadow, near Mile 14, No. 11144; on floating edge of bog west of Nisutlin River, Mile 36, No. 10828; same place, in wet moss by lake shore, Nos. 10829 and 10830; upper Rose River, in flood-plain meadows near Mile 95, No. 10395; northeast shoulder of Mount Sheldon, in black spruce muskeg near Mile 222, No. 11087; same place, in subalpine meadows, No. 11482; Ross River valley, in wet marsh near north end of Sheldon Lake, Mile 222, No. 11566; Macmillan Pass, Mackenzie-Yukon Divide, in alpine tundra near Mile 284, No. 11248.

A lowland species common everywhere along the Canol Road, on marshy lake shores, in wet meadows, and in black spruce muskegs. The species is variable, and richly branched as well as simple-stemmed specimens may be found in the same colony; the flowers, too, vary from pure white to pale pink. It flowers from late June, and fruiting specimens were seen from July 12.

HALORRHAGIDACEAE

Myriophyllum exalbescens Fern. in Rhod. **21** : 120 (1919).

Whitehorse, R. T. and M. P. Porsild, No. 274; Johnson Crossing, idem, No. 767; Rose-Lapie River pass, in shallow ponds near headwaters of Rose River, Mile 98, No. 11910; Pelly River valley, in muddy bottom of water 6 inches deep in a shallow muskeg pond near Mile 136, No. 9895; Ross River valley, in shallow delta lakes and sloughs near north end of Sheldon Lake, Mile 222, No. 11569.

Number 9895 represents a curious form with very short internodes; it was collected on June 25 in a very shallow pond where the temperature of the water must have been quite high early in the season. Perhaps this caused the flowering spikes to develop almost directly at the tip of the now elongated axis of last year's winter buds with scarcely any formation of new leaves. Number 11569 grew in 4 feet of water and had only reached anthesis on August 8.

The species is new to the flora of Yukon.

HIPPURIDACEAE

Hippuris tetraphylla L.; Porsild, Sargentia 4 : 56 (1943); Hult., Fl. Al. and Yukon 7 : 1160 (1947).

In Yukon known from the Arctic Coast.

Hippuris vulgaris L.; Hult., Fl. Al. and Yukon 7 : 1161 (1947).

Whitehorse, R. T. and M. P. Porsild, No. 268; in ponds and small sloughs on flats west of Nisutlin River, Mile 36, No. 10826; Pelly River valley, in a shallow slough near Mile 136, No. 11174; Ross River valley, common in shallow delta lakes and sloughs near north end of Sheldon Lake, Mile 222, No. 11568.

Probably common in all lowland lakes. On Pelly River, the species had almost mature fruits in a shallow, alkaline slough, on July 7.

ARALIACEAE

Oplopanax horridus (Sm.) Miq. in Ann. Mus. Bot. Ludg.-Bat. 1 : 16 (1863).

This Pacific Coast species enters the southwest corner of Yukon where it was noted, in 1950, on the Bates River, tributary to Alsek River, by Dr. E. D. Kindle of the Geological Survey of Canada.

UMBELLIFERAE

Bupleurum americanum C. & R.; Hult., Fl. Al. and Yukon 7 : 1166 (1947).

This species is common in Yukon from the Arctic Coast south to White River in southwestern Yukon but, apparently, absent in southeastern Yukon where we did not see it along the Canol Road.

Cicuta mackenzieana Raup in Journ. Arn. Arb., 17 : 279 (1936); Hult., Fl. Al. and Yukon 7 : 1169 (1947).

In a grassy slough by north end of Sheldon Lake, Mile 222, No. 11572. In Yukon previously reported from Dawson District.

Apparently a rare species along the Canol Road where it was seen nowhere else. Our specimens had fully developed flowers and young fruits on August 5.

Coelopleurum Gmelini (DC.) Ledeb., Fl. Ross. 2 : 361 (1844).

Angelica lucida Math. & Const. in N. Am. Fl. 28B : 194 (1945), as to plant of Alaska, not L.

Northwest end of Itsi Range, in a moist alpine meadow south of Mile 252, No. 11390.

Our specimens had flowers and almost mature fruits on August 22.

Mathias & Constance, l.c., consider the northwestern plant that has passed as *C. Gmelini* identical with the eastern *C. lucidum* but state that the species is "maritime." The latter statement at least is erroneous; *C. lucidum* in mountains of Gaspé Peninsula, Quebec, grows at 3,000 feet above sea-level, and *C. Gmelini* in Alaska grows in the Kokrines Mountains, 200 miles from the sea (Porsild, 1939). The new station for *C. Gmelini* in southeast Yukon is at 5,000 feet above sea-level and 400 miles from the coast. New to the flora of Yukon.

Conioselinum cnidiifolium (Turcz.) Porsild; Hult., Fl. Al. and Yukon **7** : 1176 (1947).

This species, like *Bupleurum americanum*, in Yukon has been collected in numerous stations from the Arctic Coast to Lake Kluane in southwestern Yukon. It is strange, therefore, that neither species was seen by us along the Canol Road.

Heracleum lanatum Michx., Fl. Bor.-Am. **1** : 166 (1803).

(Plate IB)

Upper Rose River, common in steep alpine meadow east of Mile 95, No. 10519; same place in alpine meadows and "flower gardens" west of Mile 95, elevation 5,600 feet, No. 10575; Rose-Lapie Pass, by alpine brook near Mile 105, Nos. 9403 and 10921; south and east slopes of Mount Sheldon, in steep, rocky ravines, by edge of snowslides, and in subalpine meadows, elevation 5,000 feet, No. 11727. Noted also on upper Macmillan River, Mile 268, and in Macmillan Pass. In Yukon otherwise collected in McArthur Mountains, Mayo District, Bostock, No. 177.

An alpine species that in southeast Yukon appears to be characteristic of, and limited to, alpine meadows near and slightly above timber-line where it grows 6 feet tall in deep, well-watered and well-drained rich soil. It often grows on steep slopes and ravines along brooks fed by huge snowdrifts accumulated during winter. It was never seen in the lowland nor in valley bottoms.

In the Rose-Lapie Pass the young leaves were pushing up near the edge of a snowfield on June 11, and on July 15 the species was in full flower at 5,600 feet on the upper Rose River. On a sunny south slope on Mount Sheldon, fully ripe fruits were collected on August 3.

Heracleum lanatum is a dominant species in the peculiar subalpine meadows noted around Mount Sheldon and elsewhere in the upper Ross valley where it grew with *Rumex arcticus, Delphinium glaucum,* and others.

The species apparently is new to the flora of Yukon.

Podistera yukonensis Math. & Const. in Bull. Torr. Bot. Cl. **77** : 136 (1950) fig. 2.

McQuesten area: south side of Little Klondike River, at 5,000 feet elevation, Campbell, No. 692 (Type, Can).

A well-marked species thus far known only from the type locality. Mathias and Constance, l.c., remark: "The new *Podistera* differs sharply from the other three species of the genus in having the oil tubes solitary under the prominent fruit ribs, instead of more than one in each of the intervals. Its scaberulous foliage with entire leaflets resembles that of the Californian *P. nevadensis* (A. Gray) S. Wats., while the general habit and well-developed rays and pedicels are more like those of the Coloradan *P. Eastwoodiae* (Coult. & Rose) Math. & Const. and the Alaskan *P.* [*Ligusticum*] *Macounii* (Coult. & Rose) Math. & Const. Even in general aspect, however, *P. yukonensis* stands out as a remarkably distinct entity."

CORNACEAE

Cornus canadensis L.; Hult., Fl. Al. and Yukon **7** : 1182 (1947).

Rose-Lapie Pass, in a ravine by mountain stream near Mile 105, No. 9809; rocky ledges and slopes west of Mile 116, No. 10074; lower Lapie Crossing, open spruce forest south of Mile 132, No. 9963; valley of the south fork of Macmillan River, in damp, mossy spruce woods near Mile 250, No. 11434 (var. *intermedia* Farr).

A common and widespread species which is ubiquitous in open, mossy spruce forest, but which occurs also in other habitats from the lowland at least to timber-line and was noted north to Macmillan Pass. On Mount Sheldon noted to 5,100 feet. In the Rose-Lapie Pass, the species flowered on June 22 and on Mount Sheldon had mature fruits on August 3.

The var. *intermedia* was the only form seen at Mile 250 where it was rather scarce but had fully mature fruits on August 21. As pointed out by the author (Rhod. **41** : 270 (1939)), Hultén's suggestion that var. *intermedia* is a hybrid (*C. canadensis* x *suecica*) is hardly tenable when we consider its much disrupted and very peculiar range, and particularly the fact that some of its stations are more than a thousand kilometers from the nearest station of *C. suecica*.

Cornus stolonifera Michx.; Hult., Fl. Al. and Yukon **7** : 1186 (1947).

Lower Lapie River crossing, in ravines on lower slope of mountain west of Mile 132, No. 9485; same place, bushes to 5 feet high in poplar grove, No. 9586. In Yukon otherwise known from several stations along the Yukon Valley and from Mayo.

Apparently a rare species in southeast Yukon where it was noted only in the places mentioned above. Our specimens flowered on June 17.

PYROLACEAE

Moneses uniflora (L.) Gray.; Hult., Fl. Al. and Yukon **8** : 1203 (1948).

Johnson Crossing, M. P. Porsild, No. 488; lower Lapie Crossing, in spruce forest near Mile 132, No. 9964.

A lowland species which is fairly common throughout Yukon in open spruce forest, on wooded river-banks, etc., but which rarely ascends above timber-line. In Rose-Lapie Pass it was noted once in an alpine meadow, and on Mount Sheldon it was rare at 5,100 feet. At Lapie Crossing *Moneses uniflora* flowered on June 20.

Pyrola asarifolia Michx. var. **incarnata** (Fisch.) Fern.; Hult., Fl. Al. and Yukon **8** : 1206 (1948).

Johnson Crossing, M. P. Porsild, Nos. 484, 581, and 631; pass between Teslin and Nisutlin Rivers, in alpine meadow near Mile 14, No. 11147; alluvial flats west of Nisutlin River, Mile 36-42, No. 10836; upper Rose River, in flood-plain spruce forest near Mile 95, No. 10399; steep west slope of range east of Mile 95, in alder thickets, elevation 4,500 feet, No. 10520; Rose-Lapie Pass, in alpine meadow above timber-line east of Mile 105, No. 9404; lower Lapie Crossing, in open spruce woods near

Mile 132, Nos. 9278 and 9685; Pelly River valley, open forested banks of muskeg lake near Mile 136, No. 9896; northeast shoulder of Mount Sheldon, in timber-line fir forest, No. 11092; southeast slope, steep ravines and ledges near timber-line, elevation 5,000 feet, Nos. 11751 and 11775; upper south fork of Macmillan River, alpine fir forest west of Mile 268, No. 11364.

A common species of moist, cool woods, collected or noted at all stations along the Canol Road but decidedly scarcer in the northern part where it is a late-flowering species. Occasionally noted a short distance above timber-line but then always among scrub fir or alder. On Mount Sheldon ascending to 5,100 feet.

On Lapie River, first noted in flower on June 20, whereas on Macmillan River it had only reached the flowering stage on August 31.

Pyrola bracteata Hook., Fl. Bor.-Am. **2** : 47 (1834).

Hultén, l.c., in discussing the status of *P. grandiflora* var. *Gormani* (Rydb.) Porsild in Rhod. **41**: 273 (1939), remarks: "It seems not absolutely impossible that *P. bracteata* Hook. might occur within our area and that such specimens [the type of *P. Gormani*] had evolved under the influence of that species."

Unknown to Hultén, typical *P. bracteata* was collected just outside the Yukon border on the British Columbia side of the Haines Road in 1943 by Clarke, No. 407. These specimens, however, bear no resemblance to *P. grandiflora* var. *Gormani* which, as shown by the writer, l.c., is very close to *P. grandiflora*.

Pyrola grandiflora Rad.; Hult., Fl. Al. and Yukon **8** : 1209 (1948). For a discussion of *P. grandiflora* and its N. Am. races, *see* Porsild in Rhod. **41** : 271-274 (1939).

Lower Lapie River crossing, in shady spruce forest west of Mile 132, Nos. 9430, 9522, 9523, and 9552 (all var. *canadensis*); pass between Teslin and Nisutlin Rivers, Mile 10, M. P. and R. T. Porsild, No. 684; alpine tundra above timber-line on mountain west of Mile 132, Nos. 9735 and 9736; south shoulder of Mount Sheldon, very scarce and sterile plants only, on rocky ledges at 6,000 feet elevation, No. 11625; northeast shoulder, fertile specimens on cliffs above timber-line, No. 11090.

The first four numbers belong to the tall, many-flowered, unscented, and long-petioled var. *canadensis* (Andres) Porsild, which seems to be the only form found in the lowland, whereas typical arctic-alpine *P. grandiflora* with few-flowered inflorescences, strongly perfumed flowers, and leaf-petioles equalling or slightly longer than the blade, inhabits the higher mountains. The distinguishing characters are not strongly marked, and in the writer's collection are a number of plants that admittedly could be referred equally well to the species or to the variety.

The var. *canadensis* apparently is rather widely distributed in northwestern America where it is an inland species ranging from Athabasca Lake north through Bear Lake to the Eskimo Lakes and west through interior Yukon and Alaska.

Another variety, *P. grandiflora* var. *Gormani* (Rydb.) Porsild, distinguished by short-petiolate, acute leaves, distinctly denticulate by the excurrent veins, apparently is rather narrowly restricted to southwestern Yukon and adjacent parts of Alaska.

Pyrola grandiflora was last seen on Mount Sheldon where it was very scarce on rocky ledges below the summit, at 6,000 feet elevation. Flowering specimens were first noted on Lapie River on June 12, fully a week earlier than *P. asarifolia* var. *incarnata*.

Pyrola minor L., Sp. Pl. 396 (1753).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 10, No. 11044; alluvial flats west of Nisutlin River, Mile 36, No. 10835; Quiet Lake, steep, densely wooded slope east of Mile 55-60, No. 11120; Rose River valley, Mile 77, in a pine bog, No. 10311; upper Rose River, in grassy flood-plain meadow near Mile 95, No. 10398; Rose-Lapie Pass, alpine slope east of Mile 105, No. 9378; northeast shoulder of Mount Sheldon, in timber-line forest, No. 11091; upper Ross Valley, in shady, dense spruce forest at foot of Mount Sheldon, Mile 222, No. 11574; upper south fork of Macmillan River, alpine slopes west of Mile 268, No. 11365. Also from Mayo District, Big Kalzas, Bostock, No. 221.

Although not previously recorded from the territory, *P. minor* is occasional to common in alpine meadows and in subalpine forest where it was collected or noted from all stations north to Macmillan Pass; on Mount Sheldon ascending to 5,600 feet. On Rose River, the first flowers were noted on July 3, and on Mount Sheldon full mature capsules were seen on August 1.

Pyrola secunda L.; Hult., Fl. Al. and Yukon **8** : 1213 (1948).

Johnson Crossing, M. P. Porsild, No. 579; rich spruce woods west of Nisutlin River, Mile 36, No. 10838; dense spruce and fir forests at base of Mount Sheldon, Mile 222, No. 11573; Macmillan Pass, Mackenzie-Yukon Divide, Mile 284, among willows in alpine tundra, No. 11253.

A common species in rich lowland forest, collected or noted from all stations north to Macmillan Pass. On Nisutlin River, fruiting specimens were collected on July 23.

Pyrola secunda L. var. **obtusata** Turcz.; Hult., Fl. Al. and Yukon **8** : 1214 (1948).

Whitehorse, pine ridges east of Lewes River, No. 10693; muskeg bogs west of Nisutlin River, Mile 36, No. 10837; lower Lapie Crossing, in deep, mossy spruce forest near Mile 132, No. 9965. Also noted in Rose-Lapie Pass and on alpine slopes of Mount Sheldon to 5,600 feet.

The var. *obtusata* may be characterized chiefly by its small, pale yellowish green leaves (1·5 x 1·0 cm.) and few-flowered racemes (average about 7) and by its more arctic-alpine distribution; and by these characters it seems well distinguished from the species which has much larger, olive green leaves (average 3·0 x 1·5 cm.) and 10- to 14-flowered racemes (Compare Porsild in Rhodora **41** : 274 (1939)). It is common in forested parts of Yukon ascending everywhere to timber-line.

The var. *obtusata* flowered on June 26 and a month later had mature fruits.

Pyrola virens Schweigg. in Schweigg. & Koerte, Fl. Erlang. **1** : 154 (1804). *See* Fernald, Rhod. **43** : 167 (1941).

P. chlorantha Hult., Fl. Al. and Yukon **8** : 1208 (1948).

Whitehorse, in pine woods east of Lewes River, No. 10694; Johnson Crossing, M. P. Porsild, Nos. 426 and 485; deep spruce woods west of Nisutlin River, Mile 36, No. 10834; lower Lapie River crossing, open spruce woods near Mile 132, Nos. 9277 and 9966; northeast shoulder of Mount Sheldon, in muskeg spruce woods near Mile 222, No. 11089. Also Mayo District, Nogold Creek, Bostock, No. 178.

Rare or occasional in deep, mossy spruce woods; not noted north of Mount Sheldon where flowers and young fruits were collected on August 13, whereas on the Lapie River, the species flowered on June 26 and a month later had matured fruits.

Previously collected in the Yukon, at Whitehorse, Lake Laberge, and at White River.

ERICACEAE

Ledum decumbens (Ait.) Lodd. ex Steud., Nom. Bot. **2** : 20 (1841).

L. palustre ssp. *decumbens* Hult., Fl. Al. and Yukon **8** : 1217 (1948).

Whitehorse, apparently rare in pine bogs east of Lewes River, No. 9212; lower Lapie River crossing, in mossy, subalpine spruce woods on mountain south of Mile 132, No. 9632; alpine tundra of north slope near summit south of Mile 132, No. 9940; northeast spur of Mount Sheldon, in spruce muskeg near Mile 226, No. 11486; south shoulder of Mount Sheldon, on rocky ledges above timber-line, elevation 6,100 feet, No. 11629; Macmillan Pass, steep rocky scree, Mile 282, No. 11283.

A common and sometimes ubiquitous arctic-alpine species of north-facing slopes above timber-line; on Mount Sheldon noted to 6,100 feet elevation; in the lowland perhaps restricted to cold muskeg bogs and dry pine ridges.

In No. 9212 from Whitehorse, the expanding petals are strongly suffused with pink. On the Lapie River, *Ledum decumbens* flowered on June 15, and on Mount Sheldon its capsules were fully mature on August 7. In Yukon previously known from the Dawson district.

Ledum groenlandicum Oed. in Fl. Dan. tab. 567 (1771).

L. palustre ssp. *groenlandicum* Hult., Fl. Al. and Yukon **8** : 1219 (1948).

Lower Lapie River crossing, in a spruce muskeg near Mile 132, No. 9553.

Hultén, l.c., remarks: "In spite of serious efforts I was unable to find a characteristic other than the breadth of the leaves distinguishing the two *Ledum* types enumerated above [*L. palustre* sspp. *decumbens* and *groenlandicum*]".

In the writer's experience *L. decumbens* and *L. groenlandicum*, wherever found, may be distinguished at once by the shape of their peduncles. In the former the peduncle is sharply and abruptly bent just below the capsule, whereas in *L. groenlandicum* the peduncle is evenly bent or curved throughout its entire length. (*See* Porsild, Medd. om Grl. **58** : 128 (1920) .) This character is very constant, and although best seen in the peduncles of mature capsules, it is equally reliable in flowering specimens or even in the persistent peduncles of former year's fruits.

A common and often dominant species which is rarely, if ever, absent in muskegs and in wet, boggy spruce and pine woods from lowland to timber-line. On Mount Sheldon ascending to 5,600 feet. On Lapie River, the species flowered abundantly on June 16.

Rhododendron lapponicum (L.) Wahlenb.; Hult., Fl. Al. and Yukon **8** : 1224 (1948).

Lower Lapie Crossing, on grassy summit of mountain south of Mile 132, elevation 5,600 feet, Nos. 9422 and 9626. Besides noted in Rose-Lapie Pass. Also Dawson Range, 62° 40′ N., 138° 33′ W. and 63° 12′ N., 135° 55′ W., Bostock, Nos. 268, 269, and 180.

Rhododendron lapponicum apparently is a rare, alpine species in Yukon where, previously, it had been collected only on high mountains near the 141st Meridian. Along the Canol Road we saw it only on high mountains of the Pelly Range, but it became common again on the east slope of the Mackenzie Mountains (N.W.T.); wherever found, it was common locally and in the Lapie Pass flowered profusely on June 12.

Loiseleuria procumbens (L.) Desv.; Hult., Fl. Al. and Yukon **8** : 1227 (1948).

Macmillan Pass, Mackenzie-Yukon Divide, elevation 5,000 feet, occasional to rare on rocky ridges near Mile 282, No. 11261. Also McArthur Mountains, 63° 10′ N., 135° 30′ W., June 11, 1942, Bostock; north fork of Klondike River, Cockfield, No. 50, and from high mountains along the 141st Meridian.

Apparently a rare arctic-alpine species in Yukon where it is probably somewhat restricted by its preference for acid, crystalline rocks. Our specimens had fully ripe capsules on August 31.

Kalmia polifolia Wang. in Schr. Ges. Nat. Freunde Berl. **2** : 130 (1788).

Pass between Teslin and Nisutlin Rivers, boggy places on mountain east of Mile 14, Nos. 11045 and 11148; upper Rose River, boggy places in rich alpine meadows west of Mile 95, elevation 5,600 feet, No. 10576; Mount Sheldon, alpine bog on northeast shoulder, No. 11094; on floating *Scirpus*-bog near Mile 226, No. 11485; similar place in saddle between Mount Sheldon and Mount Riddell, No. 11681. Noted also on the upper south fork of Macmillan River, Mile 250 and 268, and in Macmillan Pass. Also from Mayo District, between Edwards and Nelson Creeks, Bostock, No. 102.

An alpine species which is common, but always very local, and apparently is restricted to *Scirpus caespitosus* bogs near and above timberline. In the Pelly Range it flowered abundantly at 5,600 feet on July 15, and on Mount Sheldon fully mature capsules were noted on August 4.

The Yukon plant belongs to the poorly marked arctic-alpine var. *microphylla*: "folliis vix semipollicaribus subovalibus", Hook., Fl. Bor.-Am. **2** : 41 (1834). Although recorded from adjacent parts of Alaska and British Columbia, it is new to the flora of Yukon.

Phyllodoce empetriformis (Sm.) D. Don. in Edinb. New Phil. Journ. **17** : 160 (1834).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, No. 11005; Rose River valley, granite mountain east of Mile 85-90, No. 10183; upper Rose River, alpine slopes west of Mile 95, elevation 5,000 feet, No. 10220; Rose-Lapie Pass, at timber-line east of Mile 105, Nos. 9405 and 10922; south shoulder of Mount Sheldon, on grassy slopes and herbmats above timber-line, elevation 6,100 feet, No. 11630; northwest end of Itsi Range, opposite Mile 252, No. 11391; upper south fork of Macmillan River, alpine slopes and snowflushes west of Mile 268, No. 11367. Noted also in Macmillan Pass. Also Mayo District, Bostock, No. 101; north of McQuesten River, Christie, No. 73; and on the north fork of the Klondike, Cockfield, No. 48.

Phyllodoce empetriformis is common in southeast Yukon where it is a ubiquitous timber-line species closely assocated with *Abies lasiocarpa* and, like it, belongs to the Cordilleran element in the flora. Flowering specimens were first noted on upper Rose River on July 6 and the first mature capsules on August 7. Near snowflushes and on north slopes, flowering specimens may be seen until autumn frost begins. New to the flora of Yukon, and a most attractive member of its alpine flora.

Cassiope Stelleriana (Pall.) DC., Prod. **7** : 611 (1838).

Hultén, l.c., cites a collection of this species from "Dominion Creek, 1898, Bolton (US)" but erroneously lists the station under "Upper Yukon R. District," and in his map No. 929 the "dot" is placed in the White Pass district.

Dominion Creek is a tributary to Indian River in the Dawson District. It is, of course, possible that Bolton's plants somehow got mixed, for he also collected in the White Pass district, where *C. Stelleriana* is common. Otherwise, it is strange that this Pacific Coast species should occur so far inland and that no later collector rediscovered it.

Two other Bolton collections (*Kalmia microphylla* and *Phyllodoce empetriformis*), both by Hultén cited as "Fiftymile R., 1898, Bolton, (US)," by him likewise are erroneously shown as being in the White Pass district. By "Fiftymile R.," no doubt is meant Fiftymile Creek, a tributary to Sixtymile River west of the Yukon, approximately 63° 50′ N., 140° 30′ W.

Cassiope tetragona (L.) D. Don.; Hult., Fl. Al. and Yukon **8** : 1238 (1948).

Upper Rose River, upper slopes of alpine valley east of Mile 95, elevation 6,000 feet, No. 10577; Rose-Lapie Pass, upper east slope east of Mile 118, No. 10141; lower Lapie Crossing, in open spruce woods near Mile 132, No. 9279; moist north slope of mountain west of Mile 132, elevation 5,000 feet, No. 9737; south shoulder of Mount Sheldon, in scrub fir forest near tree-line, elevation 4,500 feet, No. 11682; upper south fork of Macmillan River, alpine slopes west of Mile 268, No. 11366.

The arctic-circumpolar *C. tetragona* and its well-marked Cordilleran race, ssp. *saximontana*, both occur in southeast Yukon. As might be expected, *C. tetragona* occupies the northern part and along the Canol Road was not noted south of Rose-Lapie Pass where the two races meet. The ssp. *saximontana* alone occupies the southern part of the Pelly Range as well as mountains of northern British Columbia adjacent to the Alaska Highway. Future exploration will probably show that its distribution is continuous from the southern Canadian Cordillera through the Stikine Mountains to southeast Yukon. A single, isolated station was found on Mount Sheldon where, otherwise, *C. tetragona* was the dominant species.

Cassiope tetragona is common on north-facing alpine slopes and in other places, such as timber-line spruce and fir forest where the snow remains late; in such places it is often the dominant species and forms a closed heath. Although essentially an alpine species in our area, it not infrequently occurs at valley level in deep, mossy spruce woods. On Mount Sheldon it ascends to 6,100 feet, but on exposed alpine ridges it is no longer dominant. It flowers from middle June, and mature capsules were noted from end of July.

The ssp. *saximontana* in our area is confined chiefly to snowflushes and does not appear to form extensive heaths. Due to the lateness of its habitats, it usually flowered later than the main species, but in Rose-Lapie Pass flowering specimens were collected on a sunny south slope on June 11. Excepting the Mount Sheldon station, the two races do not appear to mix, nor did we see material that suggested intergradation.

Cassiope tetragona (L.) D. Don. ssp. **saximontana** (Small) Porsild, Can. Field-Nat. **54** : 68 (1940).

C. saximontana Small in N. Am. Fl. **29** : 59 (1914).

Pass between Teslin and Nisutlin Rivers, alpine slopes east of Mile 14, No. 11004; Rose River, alpine summit east of Mile 77, No. 10955; upper Rose River, steep ravine on mountain east of Mile 95, No. 10521; Rose-Lapie Pass, schist mountain east of Mile 105, in alpine heath above timber-line, elevation 5,500 feet, No. 9406; south shoulder of Mount Sheldon, elevation 4,500 feet, No. 11994. Also from adjacent British Columbia: Alaska Highway, Swift River, Clarke, No. 128; Muncho Lake, Rand, No. 24; Haines Road just south of boundary, M. P. and R. T. Porsild, No. 220.

This Cordilleran race differs consistently from the circumpolar *C. tetragona* by its smaller flowers and short peduncles. In *C. tetragona* the flowers of the year appear near the tip of the branches and even in anthesis overtop these. In ssp. *saximontana*, the flowers appear well below the tip of the branch, and even the terminal ones do not overtop the tip of the branches, nor do the short peduncles elongate during the post-floral period. For its Yukon distribution, see under the species.

Subspecies *saximontana* is the only race found in the Canadian Cordillera with an isolated station in southwest Mackenzie (Porsild, l.c.). The present collections extend the known range to southeast Yukon.

Andromeda Polifolia L.; Hult., Fl. Al. and Yukon **8** : 1240 (1948).

Lower Lapie Crossing, in damp, mossy spruce woods near Mile 132, No. 9280; same place, in a muskeg, No. 9588; northeast spur of Mount Sheldon on floating *Scirpus caespitosus* bog near Mile 226, No. 11484. Also noted in pine bogs at Nisutlin River, Mile 36, and in a *Scirpus* bog on Rose River, Mile 77. Also from Mayo, Bostock, No. 103, and from several collections in the Dawson District.

Rare to occasional in the lowland where it apparently is restricted to *Scirpus caespitosus* bogs where it often is found associating with *Lycopodium Selago, Selaginella selaginoides, Tofieldia pusilla*, etc.

On Lapie River, the species flowered on June 10 and on Mount Sheldon had immature fruits on August 4.

Chamaedaphne calyculata (L.) Moench; Hult., Fl. Al. and Yukon 8 : 1242 (1948).

Ross River valley, wet, swampy northwest shore of Sheldon Lake near Mile 222, No. 11575.

Previously known from Dawson and Mayo Districts but apparently not common in Yukon. Our specimens had flowered late and probably would not mature fruits.

Arctostaphylos alpina (L.) Spreng.; Hult., Fl. Al. and Yukon 8 : 1245 (1948).

Pass between Teslin and Nisutlin Rivers, rocky summit of granite mountain east of Mile 14, No. 11003; upper Rose River, rocky ridge and scree west of Mile 95, No. 10401; south shoulder of Mount Sheldon, in mossy places in north-facing ravine above timber-line, No. 11626. Also noted above timber-line on the south fork of Macmillan River, Mile 268, and in Macmillan Pass. Also Mayo District, north of McQuesten River, Christie, No. 80, and from two collections in Dawson District.

An arctic-alpine species which, as elsewhere, is restricted to acid rocks and their derivatives, and for this reason its occurrence is spotty along the Canol Road. When found, it was always plentiful; on Mount Sheldon ascending to 6,100 feet. It flowers early, almost as soon as the snow leaves, and on the Ross River had fully mature fruits on July 14.

Arctostaphylos rubra (Rehder & Wilson) Fern. in Rhod. **16** : 32 (1914).

A. alpina ssp. *rubra* Hult., Fl. Al. and Yukon 8 : 1244 (1948).

Whitehorse, common in spruce muskegs east of Lewes River, No. 9209; Rose-Lapie Pass, in a muskeg near Mile 105, No. 9252; same place, common in mossy woods, No. 9322; lower Lapie Crossing, in muskeg near Mile 132, No. 9587; northeast shoulder of Mount Sheldon, in black spruce muskeg near Mile 222, No. 11093; in mossy spruce woods along south fork of Macmillan River, Mile 250, No. 11435; Macmillan Pass, Mackenzie-Yukon Divide, Mile 282, No. 11255.

Throughout the Yukon this is a common lowland species which is ubiquitous in muskegs and damp spruce woods on calcareous rocks; it is less common but sometimes heath-forming above timber-line; on Mount Sheldon and in Macmillan Pass ascending to 5,100 feet.

Soon after the first severe autumn frost, the foliage of *A. rubra* turns a brilliant wine-red, and in September the hillsides on the upper Macmillan River and Macmillan Pass were gay with colour from this dwarf shrub.

In spring, the flowers of *A. rubra* are among the very first to appear; at Whitehorse, small green fruits were collected on June 1, and on Lapie River, the fully mature, bright red fruits were collected on June 17. The fruits are edible but watery and insipid; they are eaten extensively by bears.

Arctostaphylos Uva-ursi (L.) Spreng.; Hult., Fl. Al. and Yukon 8 : 1247 (1948).

Whitehorse, very common on dry pine ridges east of Lewes River, No. 9210; upper Rose River, on gravelly flood-plains near Mile 95, No. 10402; Rose-Lapie Pass, on sunny cliffs east of Mile 105, No. 9321; Pelly River valley, dominant ground cover on burnt-over hillsides near Mile 136, No. 9669; south slope of Mount Sheldon, dry slopes above timber-line opposite Mile 222, No. 11752. Noted also on the Nisutlin River but not north of Mount Sheldon.

Arctostaphylos Uva-ursi is common throughout Yukon on dry, south-facing slopes, open pine ridges, and on cliffs; it was a dominant species on the extensive burnt-over slopes of Pelly Valley, which are now returning to aspen, and to a lesser degree in burns on upper Rose River. In Pelly Valley, it flowered the first week of June and on Mount Sheldon had mature fruits on August 6.

Although Fernald, l.c., includes Yukon in the range given for var. *coactilis* Fern. & McBride, the specimens listed above all belong to the var. *adenotricha* Fern. & McBride, Rhod. **16** : 213 (1914), as do all specimens seen by the writer from Yukon and central interior Alaska. In var. *adenotricha* the branchlets and petioles are distinctly villous-viscid; so much so that in life the young twigs are glutinous to the feel. It is strange, therefore, that Hultén, l.c., refers the population from "Upper and Central Yukon River" to var. *coactilis*, stating that the herbarium material seen by him possesses the "permanent tomentum characteristic of that variety." The plant of western Alaska seems inseparable from that of the Old World, whereas a separate race, var. *pacifica* Hult., is found along the Pacific Coast from the Aleutian Islands eastward.

Oxycoccus microcarpus Turcz. ex Rupr. in Beitr. 3. Pflanzenk. des Russ. Reich. **4** : 56 (1845); Porsild in Can. Field-Nat. **52** : 116-7 (1938); Hult., Fl. Al. and Yukon **8** : 1249 (1948).

Vaccinium Oxycoccus Am. auth., in part.

Nisutlin River, in sphagnum bogs west of Mile 42, No. 10839; Rose River valley, in pine and spruce bogs near Mile 77, No. 10312; lower Lapie River crossing, in a black spruce muskeg near Mile 132, growing in *Sphagnum fuscum* with *Pinguicula villosa*, Nos. 9967 and 9968. Noted also in Rose-Lapie Pass, Mile 95-105, on the south fork of Macmillan River, Mile 250 and 268, and in Macmillan Pass, Mile 284-6. In Yukon previously known from Dawson and Mayo Districts.

Rarely absent in black spruce sphagnum bogs where it flowered from end of June and on Nisutlin River had matured fruits on July 23.

Vaccinium caespitosum Michx.; Hult., Fl. Al. and Yukon **8** : 1253 (1948).

Pass between Teslin and Nisutlin Rivers, in subalpine meadow near Mile 14, elevation 4,000 feet, No. 11149; in pine woods west of Nisutlin River, Mile 36-42, No. 10841; Rose River valley, forested slope east of Mile 85-90, elevation 5,000 feet, No. 10182; upper Rose River, in open flood-plain spruce forest near Mile 95, No. 10400; under willows in alpine meadows west of Mile 95, elevation 5,600 feet, No. 10578; Rose-Lapie Pass, on snowflushes above timber-line on mountain east of Mile 105, No. 9407. In Yukon previously recorded once from Dawson.

An alpine species which, in the Pelly Range, is rarely absent by the edge of snowflushes and under low willows in alpine meadows near and above timber-line but not noted north of Pelly River. Occasional, also, in pine and spruce forest in the lowland.

On June 11, *V. caespitosum* had large, still unopened buds at 5,000 feet in the Lapie Pass; on July 23, almost mature fruits were noted on the Nisutlin.

The present series closes a wide gap in the known distribution of *V. caespitosum*, between central Alaska and northern British Columbia. Reports of *V. caespitosum* from Herschel Island, Yukon, by Macoun and Holm in Rept., Can. Arct. Exp. **5A** : 18 (1921) are actually based on *Salix phlebophylla* (Porsild, 1943).

Vaccinium uliginosum L.; Hult., Fl. Al. and Yukon **8** : 1258 (1948).

Whitehorse, common in wet flats along Lewes River, associated with *Salix myrtillifolia*, No. 9211; on swampy benches west of Nisutlin River, Mile 36-46, No. 10840; summits east of Rose River, Mile 77, in alpine lichen heath, No. 10956; in pine and spruce bogs near Mile 77, No. 10313; Rose-Lapie Pass, grassy slopes near Mile 102, No. 9365; alpine slopes east of Mile 105, elevation 5,500 feet, No. 9350; lower Lapie Crossing, in a muskeg near Mile 132, No. 9589; Ross Valley, sandy east shore of Lake Sheldon, opposite Mile 222, Nos. 11577A and 11577B; south shoulder of Mount Sheldon, on rocky ledges below summit, elevation 6,000 feet, Nos. 11627 and 11628.

Vaccinium uliginosum is a common species in southeast Yukon where it occurs in a great variety of habitats and where, accordingly, several ecological forms occur. A tall, large-leaved form occurs in the lowland where it is often dominant in muskegs and in rather wet but open spruce or pine bogs; a low, more or less prostrate form is found on rocky ledges on the mountains, on Mount Sheldon to 6,100 feet. This alpine form is not, however, the var. *alpinum* Big., which was not seen by us. In muskeg bogs near Mount Sheldon two ecotypes grew side by side and superficially looked alike. Both were erect, 2-foot bushes (Nos. 11577 A and B).

	A	*B*
Leaf:	obovate, usually with rounded, obtuse tip: average 1·4 x 1·1 cm.	lanceolate-oblanceolate with distinctly acute apex; average 1·6 x 1·1 cm.
Berry:	singly, globular, average diameter 1·0 cm., sweet	2-3 clustered together, pear-shaped, average 1·6 x 1·1 cm., sour
Seeds:	0·6 mm. long	1·0 mm. long
Style:	soon deciduous	persistent
Stigma:	capitate	continuous

At Whitehorse, *V. uliginosum* flowered June 1 and in the Rose-Lapie Pass at 5,500 feet elevation, 10 days later; fully mature fruits were first noted on Nisutlin River on July 23. The berries were plentiful in 1944 and very palatable. Fifty-one annual rings were counted in the 4 mm. thick stem of a plant grown in a bog at Whitehorse.

Vaccinium Vitis-idaea L. var. **minus** Lodd., Bot. Cab. tab. 1023 (1825).

V. Vitis-idaea ssp. *minus* Hult., Fl. Al. and Yukon **8** : 1262 (1948).

Swampy spruce woods west of Nisutlin River, Mile 36, No. 10842; Rose-Lapie Pass, east slope of mountain west of Mile 118, No. 10142;

lower Lapie Crossing, in a black spruce muskeg near Mile 132, No. 9554. Noted from all stations.

One of the most common plants of the area, where it is rarely absent in muskegs, cool spruce woods, heaths, sunny cliffs, etc. On Mount Sheldon ascending to 7,200 feet.

In Pelly Range, plants infected by the rust *Calyptospora Goeppertiana* Kühn were very common.

The species flowers from early June, and in August the mature fruits were abundant everywhere. The fruits make excellent jam and when frozen may be kept fresh throughout the winter.

DIAPENSIACEAE

Diapensia obovata (Fr. Schm.) Nakai in Nakai & Koidzuma, Trees and Shrubs of Japan 194 (1922).

D. lapponica ssp. *obovata* Hult., Fl. Al. and Yukon **8** : 1265 (1948).

Dawson Range, 62° 40′ N., 138° 30′ W., Bostock, No. 270, Mayo District; McArthur Range, idem, No. 181. In Yukon previously known from two stations along the 141st Meridian. An Asiatic species which in North America extends east through mountains of Alaska and Yukon to Richardson Mountains, west of Mackenzie Delta.

PRIMULACEAE

Primula borealis Duby; Hult., Fl. Al. and Yukon **8** : 1268 (1948).

Apparently a purely littoral species which, in Yukon, has been collected only in salt marshes along the Arctic Coast.

Primula egaliksensis Wormskj.; Hult., Fl. Al. and Yukon **8** : 1271 (1948).

Alluvial meadows west of Nisutlin River, Mile 36, No. 10844 (f. *violacea* Fern.); Rose River, in calcareous sand by river, Mile 77, No. 10314; upper Rose River, in wet places in river meadow, Mile 95, No. 10409.

Rare or occasional in wet flood-plain meadows; not seen north of Rose-Lapie Pass where it flowered on July 3. In Yukon previously collected a few times along Yukon River and at Kluane Lake.

Primula mistassinica Michx.; Hult., Fl. Al. and Yukon **8** : 1272 (1948).

In Yukon thus far recorded only from Frances Lake in southeastern Yukon. In 1944 we found it very common at Liard Hot Springs just outside the Yukon boundary, No. 9098.

Primula sibirica Jacq.; Hult., Fl. Al. and Yukon **8** : 1273 (1948).

Besides the four stations cited by Hultén on the upper Yukon, this species has been collected in Yukon in the Mayo District, on Bear Creek, a tributary to McQuesten River, June 2, 1946, J. W. Abbott (Can). The flowers are large and showy as in *P. borealis.*

Primula stricta Hornem.; Hult., Fl. Al. and Yukon **8** : 1274 (1948).

Whitehorse, sandy beach of lake in foothills east of Lewes River, No. 9215; in a swampy flat east of Nisutlin River, Mile 36, No. 10843;

Pelly River valley, on hummock by a marly bog near Mile 136, Nos. 9670 and 9784.

Apparently rare or occasional and confined to marl bogs. Not seen north of Pelly River where flowering specimens were collected on June 17 and fruiting ones on Nisutlin River July 23.

In Yukon previously known from a few collections on the upper Yukon.

Primula tschuktschorum Kjellm.; Hult., Fl. Al. and Yukon **8** : 1275 (1948).

P. eximia Greene.

According to Hultén, l.c., collected once in Yukon, along the 141st Meridian, on Ladue River.

Douglasia arctica Hook.; Hult., Fl. Al. and Yukon **8** : 1277 (1948).

A very rare species which, thus far, is known only from the arctic coast of Yukon and from the Richardson Mountains west of Mackenzie Delta.

Douglasia Gormanii Constance in Am. Midl. Nat. **19** : 257 (1938); Scamman, Rhod. **42** : 336 (1940); Hult., Fl. Al. and Yukon **8** : 1278 (1948).

Three new Yukon stations should be added to those given by Hultén, l.c.: Dawson Range, elevation 5,000 feet, 62° 35′ N., 138° 20′ W., Bostock, No. 271; north slope of McArthur Range, elevation 6,000 feet, ibid., No. 182; and Golden Horn Mountain south of Whitehorse, elevation 5,800 feet, July 29, 1944, C. W. Huddelson.

Douglasia Gormanii differs from the closely related *D. arctica* by its branched pubescence on the margins and upper surface of the leaves, shorter peduncles, and more pulvinate-caespitose growth form. It is an endemic of high mountains of central Yukon and Alaska, whereas *D. arctica* thus far is known only from the arctic coast of Yukon west of Mackenzie Delta and from Richardson Mountains, latitude 68° 40′.

Androsace Chamaejasme Host. var. **arctica** R. Knuth in Pax & Knuth in Pflanzenr. **22** (iv. 237): 190 (1905).

A. Chamaejasme ssp. *Lehmanniana* Hult., Fl. Al. and Yukon **8** : 1280 (1948).

Dawson Range, 62° 35′ N., 138° 20′ W., Bostock, No. 272; Kluane Lake, elevation 6,000 to 7,000 feet, Clarke, No. 278.

A western arctic race which in Yukon has been collected a few times in mountains along the 141st Meridian and on the Arctic Coast. As was the case of other species of similar distribution, *A. Chamaejasme* var. *arctica* was not seen by us in mountains of southeastern Yukon but was common on the east slope of the Mackenzie Mountains (N.W.T.). It probably occurs in the Ogilvie Range.

Androsace septentrionalis L. s.lat.; Hult., Fl. Al. and Yukon **8** : 1283 (1948). Compare also St. John, in Vict. Mem. Mus. Mem. **126** : 45-55 (1922).

Whitehorse, dry slopes and river-banks, Nos. 9213 and 9214; Rose-Lapie Pass, rare on dry slopes near Mile 102, No. 9366; lower Lapie Crossing, lower dry shaly slopes of mountain west of Mile 132, No. 9486; same place, slopes above timber-line, No. 9738.

Apparently *Androsace septentrionalis* is restricted to the southern part of our area where it grew on dry, sunny, calcareous slopes; in the Pelly Range it ascends to 5,600 feet.

The series is variable as to size, relative length of scapes and peduncles. Thus, giant specimens collected at Whitehorse (Nos. 9213 and 9214) are 27 cm. tall and have more than 30 flowering scapes bearing flowers and almost mature capsules on June 1-5. The pedicels vary in number from a few to 20, and in length from 2 to 4 cm.; these larger specimens may thus be referred to var. *robusta* St. John. In other specimens (No. 9738), the pedicels equal the length of the scape and thus, according to St. John, are referable to var. *diffusa* Gray. The balance have 1 to 4 scapes and thus agree with var. *typica.*

In any one large colony, plants may be found that may equally well be referred to either var. *robusta,* var. *diffusa,* or to the species.

Trientalis europaea L. ssp. **arctica** (Fisch.) Hult., Fl. Kamtch. **4** : 56 (1930).

Pass between Teslin and Nisutlin Rivers, under willows in subalpine meadow near Mile 14, No. 11150; south shoulder of Mount Sheldon, elevation 4,500 feet, in willow thicket by edge of alpine meadow in saddle between Mount Sheldon and Mount Riddell, No. 11683.

Apparently a very rare plant in our area where it was searched for in vain in numerous suitable places. The Nisutlin specimens flowered on July 3, and on Mount Sheldon it had almost mature fruits on August 10. In Yukon previously collected in the Dawson District.

Trientalis latifolia Hook., Fl. Bor.-Am. **2** : 121 (1838).

? *T. europaea* Hult., Fl. Al. and Yukon **8** : 1291 (1948), in part.

This plant has been variously treated as *T. europaea* or *T. europaea* var. *latifolia.* Its distribution certainly strongly suggests a distinct American geographical race (Rydberg, Rocky Mountains "B.C.-Calif.-Ida."). A single collection from Yukon: Mayo District, Keno, June 20-28, 1927, Mrs. Geo. Black (Can), extends the known range of this plant by more than 1,000 miles and is indistinguishable from material from southern British Columbia and, like it, has a pale rose corolla.

Glaux maritima L.; Hult., Fl. Al. and Yukon **8** : 1294 (1948).

Whitehorse, by edge of alkaline ponds northeast of town, No. 10695. In Yukon previously recorded from Alaska Highway west of Whitehorse.

Dodecatheon frigidum DC.; Hult., Fl. Al. and Yukon **8** : 1285 (1948).

Pass between Teslin and Nisutlin Rivers, in alpine herbmats on mountain east of Mile 14, No. 11006; Rose River, in wet places by a brook near Mile 77, No. 10315; Rose-Lapie Pass, common in wet places in subalpine fir forest, near Mile 105, Nos. 9323 and 9340; in alpine meadows and on snowflushes above timber-line, elevation 5,000 feet, No. 9408; by an alpine brook on mountain west of Mile 118, No. 10143; lower Lapie Crossing, grassy summit of mountain south of Mile 132, elevation 5,000 feet, No. 9941; in ravines on south and east slopes of Mount Sheldon, elevation 5,600 feet, No. 11728. Noted also on south fork of Macmillan River, Mile 250.

A western arctic-alpine species which in Yukon is common in moist subalpine meadows, in moss by alpine brooks and by snowflushes. On Mount Sheldon ascending to 5,600 feet. In the Rose-Lapie Pass *Dodecatheon frigidum* flowered simultaneously at river level (3,600 feet) and on alpine summits (5,600 feet) on June 10-11, and by mid-July had mature fruits.

Dodecatheon pauciflorum (Durand) Greene; Hult., Fl. Al. and Yukon **8** : 1289 (1948).

A Cordilleran species which in the Mackenzie Basin extends north to Slave Lake, with a disjunct station near Dawson, Yukon, Eastwood, No. 84.

PLUMBAGINACEAE

Armeria maritima (Mill.) Willd. ssp. **arctica** (Cham.) Hult.

Thus far no *Armeria* appears to have been collected in Yukon. The ssp. *arctica*, however, has been collected in the Mackenzie Delta near the Yukon border as well as along the Canol Road, on the east slope of the Mackenzie Mountains (Porsild, 1945), and undoubtedly will be found in the Ogilvie Range and elsewhere in northern Yukon.

GENTIANACEAE

Gentiana algida Pall.; Hult., Fl. Al. and Yukon **8** : 1300 (1948).

Apparently a very rare species in the Yukon where it has been collected only a few times: at Kluane Lake, on high mountains of Dawson Range, and along the 141st Meridian.

Gentiana Amarella L., Sp. Pl. 230 (1753).

G. acuta Hult., Fl. Al. and Yukon **8** : 1298 (1948).

Whitehorse, August 6, 1944, R. T. Porsild; Johnson Crossing, M. P. Porsild, No. 630, river meadows west of Nisutlin River, Mile 36, No. 10847; northeast spur of Mount Sheldon, in rich subalpine meadows near Mile 226, No. 11488. Also from Mayo District, Clarke's Peak, Bostock, No. 225; Dawson, John Macoun, Can, 91234 and 91235, and Rink Rapids, 91237, and from southwestern Yukon.

Not noted elsewhere by us and, apparently, in southeast Yukon belongs to the group of prairie species which is restricted here to subalpine relic grassland. On Nisutlin River, *G. Amarella* flowered on July 26 and on Mount Sheldon had flowers and immature capsules on August 4.

Fernald, in Rhod. **19** : 149-151 (1917), has pointed out that *G. acuta* Michx., *G. plebeia* Cham. ex Bunge (to which could be added *G. scopulorum* Greene and *G. strictiflora* Rydb.) cannot be satisfactorily separated from European *G. Amarella* L.

Gentiana arctophila Griseb. in Hook., Fl. Bor.-Am. **2** : 61 tab. 149 (1838); Porsild, Sargentia **4** : 55 (1943); Hult., Fl. Al. and Yukon **8** : 1302 (1948).

Rose-Lapie Pass, rather scarce in alpine meadows and snowflushes east of Mile 105, elevation 5,600 feet, No. 10926; also collected in Macmillan Pass, Mile 284, and from Mayo District, Bostock, No. 224.

A pretty little species which, in its typical form, is easily separated from *G. propinqua*. In our No. 10926, the specimens measure from 2·5 to 4 cm. in height, with a single flower, 10 to 18 mm. long, or rarely with a few smaller auxiliary ones. It flowered on July 21.

When Hultén, l.c., states that *G. arctophila* is perhaps an arctic race of *G. propinqua*, he perhaps overlooks that part of Grisebach's material came from the Canadian Rocky Mountains, where the species is not uncommon.

Gentiana glauca Pall.; Hult., Fl. Al. and Yukon **8** : 1306 (1948).

Pass between Teslin and Nisutlin Rivers, in subalpine meadow near Mile 14, No. 11151; Rose River, alpine slopes of mountain east of Mile 77, No. 10958; upper Rose River, rocky summit east of Mile 85-90, No. 10184; alpine valley west of Mile 95, No. 10221 (f. *albiflora*); south shoulder of Mount Sheldon in timber-line scrub fir forest, elevation 4,500 feet, No. 11684; upper south fork of Macmillan River, in alpine heath above timber-line, west of Mile 268, No. 11369. Noted as common in Macmillan Pass, Mile 284. Also from the Mayo District, Bostock, Nos. 109 and 110; McQuesten Lake, Cockfield (Can, 97685); north fork of Klondike River, idem, No. 52; Alaska-Yukon Boundary, latitude 65° 31′-58′, D. D. Cairnes, Nos. 45 and 46.

A common species in alpine heath and on snowflushes; on Mount Sheldon ascending to 6,100 feet. In the Pelly Range it flowered on July 4 and on Mount Sheldon had mature seeds on August 10.

Gentiana Macounii Holm in Ott. Nat. **15** : 110 (1901), tab. X.

G. barbata Hult., Fl. Al. and Yukon **8** : 1302 (1948), pro min. ptc.

In the National Herbarium of Canada is a single collection from southwest Yukon, Alaska Highway, Mile 1022, Anderson and Brown, No. 10065. A considerable extension of the known range of a well-marked species otherwise known from James Bay west to Alberta and southwest British Columbia.

Gentiana propinqua Richards.; Hult., Fl. Al. and Yukon **8** : 1308 (1948).

Johnson Crossing, M. P. Porsild, Nos. 120B and 427; west bank of Nisutlin River, flood-plain near Mile 36, No. 10849; upper Rose River, river-banks and flood-plains near Mile 95, No. 10403; Rose-Lapie Pass, alpine summit east of Mile 105, No. 9344; lower Lapie Crossing, dry, sunny slopes near Mile 132, No. 9969; same place, gravel bars in river, No. 9991; southeast corner of Mount Sheldon, on dry slopes and ledges near timber-line, No. 11753.

A common lowland species which is rarely absent on dry, sunny slopes, on gravelly river-flats, and in open spruce forest. On Mount

Sheldon ascending to 5,100 feet. On Lapie River, the first flowers were noted on June 26, and on Mount Sheldon flowering and fruiting specimens were collected on August 11.

Gentiana propinqua, *G. arctophila*, *G. Amarella*, and *G. prostrata*, in southeast Yukon, are probably always winter annuals whose tiny seedlings may be seen in spring around last year's fruiting plants; thus, in Rose-Lapie Pass, seedlings of *G. propinqua*, 2 cm. high, were noted emerging from under the snow at 5,000 feet on June 11. Seasonal dimorphism was not noted in any of these species.

Gentiana prostrata Haenke; Hult., Fl. Al. and Yukon **8** : 1310 (1948).

G. prostrata var. *americana* Engelm.

Upper Rose River, in wet sand on river-flat near Mile 95, No. 10410; Rose-Lapie Pass, alpine snowflushes above timber-line east of Mile 105, elevation 5,600 feet, No. 10925; lower Lapie Crossing, grassy summit of mountain south of Mile 132, No. 9942. In Yukon previously known from the southwestern part.

A rare, or perhaps sometimes overlooked, alpine species collected by us only in the Pelly Range where it ascends to 5,600 feet. At Lapie Crossing it flowered at 5,600 feet on June 26 when the smallest specimens were only one centimetre high.

The American representative of this species (var. *americana* Engelm.) is said to have a 4-lobed corolla, whereas that of Eurasia is 5-merous. As pointed out by Raup in Contr. Arnold Arb. **6** : 192 (1934), 4- or 5-merous corollas are equally common, at least in the plant of the Canadian Cordillera, Yukon, and Alaska.

Gentiana Raupii Porsild in Sargentia **4** : 60 (1943).

G. holopetala Rydb. in Bull. N. Y. Bot. Gard. **2** : 180 (1901), not *G. serrata* var. *holopetala* Gray.

G. detonsa Fr. var. *simplex* Hook., Fl. Bor.-Am. **2** : 64 (1838), in part.

G. barbata Hult., Fl. Al. and Yukon **8** : 1302 (1948), pro max. pte.

(Plate XXVI)

Pelly River below Braden Canyon, latitude 62° 55′, longitude, 136° 32′, Bostock, No. 226; White River, Snag Airport, July 10, 1944, G. A. Noel; Ranch Valley, Gorman, No. 1081, and Carmacks, Eastwood, No. 567 (all Can).

This very pretty species was recently described from the upper Mackenzie Basin, where it is common on clay river-banks. The present collection closes a gap between the upper Mackenzie Basin and central Alaska.

A specimen in the Gray Herbarium, labelled "*G. barbata* γ of Hooker's Fl. - Carlt. Hs. to Bear Lake - Richardson," clearly is *G. Raupii*.

Gentiana Richardsonii Porsild n.sp.

G. ? detonsa Porsild in Sargentia **4** : 59-60 (1943).

G. detonsa γ *simplex* Griseb. in Hook., Fl. Bor.-Am. **2** : 64 (1838), as regards Richardson's plant from "Arctic sea-shore".

G. detonsa Hult., Fl. Al. and Yukon **8** : 1304 (1948).

(Plate XXVII, figures 1-10)

Herba biennis glaberrima purpurascens; caules graciles 5-20 cm alti, quadrangulares, simplices vel e basi ramis minoribus paucis. – Folia radicalia oblanceolata obtusa, sessilia vel brevissime petiolata, 5-20 mm longa, nervo subtus prominente. – Par foliorum caulinorum singulus aut in plurimis nullus, angustiora lineari-lanceolata acuta, sessilia basi subconnata. – Pedunculi 3-15 cm longi, uniflori. – Calyx atro-purpureus, fere ad tertiam partem altitudinis 4-lobus lobis subaequalibus, deltoideis longe acuminatis, marginibus membranaceis glaberrimis, prominenter carinatis nigrescentibus. – Corolla cyanea, anguste infundibuliformis, 1·5-3·0 cm longa, quadrilobata fere ad medium fissa, lobis anguste oblongis truncatis margine efimbriatis, apice haud eroso-dentatis. – Glandulae nectariferae valde reductae vel nullae. – Stamina 4, filamentis glabris dilatis vel infra alatis; anthera parva 1 mm longa. – Stigmata obscure bilobata subsessilia vix exserta. – Semina parva 0·4-0·5 x 0·2-0·3 mm, valide papillosa.

Gentiana Richardsonii is named for Sir John Richardson who first collected it on "the arctic sea-shore" and in his manuscript named it *G. intermedia*. It belongs in the section CROSSOPETALUM DC. and is similar, and no doubt closely related to *G. detonsa* Rottb. of arctic Eurasia and Greenland, but differs from it by its broader and obtuse basal leaves, shorter and less attenuate calyx lobes, and by its much narrower corolla lobes and more papillose seeds. Superficially, it resembles dwarfed specimens of *G. Raupii*, a more southern species, which, however, is well separated from it by its broad, fimbriate corolla lobes, much longer anthers, and longer styles.

Arctic Coast east of Mackenzie Delta, about latitude 70° N. and 131° 20′ W., on a dry, sandy slope 8 miles from the coast, August 1-3, 1927, A. E. and R. T. Porsild, No. 2653 (Type); Kotzebue Sound, Alaska, August 9-16, 1945, E. Scamman, No. 4663 (Can, G).

Gentiani Richardsonii thus far is known only from the two widely separated stations mentioned above but undoubtedly will be found along the arctic coast of Yukon and Alaska.

Gentiana tenella Rottb.; Hult., Fl. Al. and Yukon **8** : 1311 (1948).

G. falcata Bakewell Rhod. **45** : 314 (1943).

St. Elias Range, vicinity of Mount Tempest, elevation 6,000 to 9,000 feet, A. Bakewell, Nos. 80 and 150 (G).

In North America otherwise known from Bering Sea and Bering Strait, southeast Alaska, Utah, Colorado, California (*G. monantha* Nels.), Bathurst Inlet, N.W.T., Hudson Bay, northern Ungava, and east and west Greenland.

Lomatogonium rotatum (L.) Fr.; Hult., Fl. Al. and Yukon **8** : 1313 (1948).

Whitehorse, river-banks and lake shores east of Lewes River, No. 10696. In Yukon previously recorded a few times from the southwestern parts and from Mayo District. Also known from Shingle Point on the Arctic Coast.

Flowering abundantly on July 28-29.

Menyanthes trifoliata L.; Hult., Fl. Al. and Yukon. **8** : 1316 (1948).

Rose River valley, marshy places and ponds in pine and spruce bogs near Mile 77, No. 10316; northeast spur of Mount Sheldon, on floating *Scirpus caespitosus* bog near Mile 226, No. 11487. Also in the Dawson District, and collected once along the 141st Meridian.

On Rose River, *M. trifoliata* was past flowering on July 3 and at Mount Sheldon had mature fruits on August 4.

APOCYNACEAE

Apocynum androsaemifolium L.; Hult., Fl. Al. and Yukon **8** : 1317 (1948).

Rose-Lapie River pass, southwest slope of mountain west of Mile 116, south-facing gravel-plate screes at, or above, timber-line, elevation 5,000 feet, No. 10076.

Previously known also from Dawson and Mayo Districts. Our specimens flowered on July 1.

POLEMONIACEAE

Phlox Hoodii Richards.; Hult., Fl. Al. and Yukon **8** : 1318 (1948).

Red Mountain (Yukon River, below Fort Selkirk) Gorman, No. 974; Mayo District, Macmillan Mountains, latitude 63°, longitude 136°, Bostock, No. 223.

The distribution of this species of dry foothill prairie is very peculiar. Its southern area extends from southwest Manitoba, Sask., west to Crowsnest Pass, Alta., south to Nebraska, Wyoming, and Idaho. Its northern area comprises two stations on the upper Yukon, both near Selkirk, and two in northeast Alaska on Porcupine River (Sheenjek Valley, J. B. Mertie, 1926, and O. J. Murie on Coleman River, 1926).

Phlox sibirica L.; Hult., Fl. Al. and Yukon **8** : 1318 (1948).

The Yukon plant here tentatively placed under *P. sibirica*, when better known, may prove distinct; thus far it is known along the arctic coast of Alaska from Seward Peninsula east to Richardson Mountains west of Mackenzie Delta, Porsild, No. 6712, where, by me, in Sargentia 4 : 61 (1943), it was erroneously referred to *P. Richardsonii* Hook.; it enters Yukon on Wind River, Camsell, July 10, 1905 (Can. No. 67891) and has been collected in latitude 67 degrees North on the Alaska-Yukon Boundary by Nelles, No. 31.

Gilia capitata Dougl.; Hult., Fl. Al. and Yukon **8** : 1319 (1948).

Collected once at Dawson where it was introduced.

Microsteris gracilis (Dougl.) Greene in Pitt. **3** : 300 (1887).

Johnson Crossing, in woods, M. P. Porsild, No. 429. Probably a recent introduction.

Collomia linearis Nutt.; Hult., Fl. Al. and Yukon **8** : 1320 (1948).

A recently introduced weed collected once at Mayo.

Polemonium acutiflorum Willd.; Hult., Fl. Al. and Yukon **8** : 1320 (1948), pro max. pte.

Pass between Teslin and Nisutlin Rivers, alpine slopes and summit opposite Mile 10-14, No. 11007; river-banks and alluvial flats along west bank of Nisutlin River, opposite Mile 36-42, No. 10845; river-flats, upper Rose River, Mile 95, flowering and fruiting specimens on July 14, No. 10404; lower Lapie River crossing, Mile 132, in rich poplar woods, No. 9591; in spruce woods, No. 9627; moist alpine north slope of mountain west of road, elevation 5,000 feet, No. 9740.

Polemonium acutiflorum apparently is common throughout Yukon and was noted by us along Canol Road in all places where collections were made. It prefers rather moist places rich in peaty humus and is particularly abundant in grassy, alpine meadows. It flowers from the middle of June to the end of August; fruiting specimens were first seen on July 14. Except in size the species varies very little.

Polemonium boreale Adams.; Hult., Fl. Al. and Yukon **8** : 1324 (1948).

An arctic-alpine species which in Yukon perhaps is restricted to limestone screes of high mountains and the Arctic Coast. The writer has seen no material from interior Yukon, but typical *P. boreale* was collected along Canol Road on the east slope of Mackenzie Mountains, N.W.T. (Wynne-Edwards, No. 8366) and on mountains along the Haines Road, B.C. (Clarke, No. 458). It is probably common in Ogilvie Range and elsewhere in the mountains of northern Yukon.

Polemonium occidentale Greene in Pitt. **2** : 75 (1900); Brand, Polemon. 33 (1907).

P. acutiflorum Hult., Fl. Al. and Yukon **8** : 1320 (1948), pro min. pte.

Dawson, Hunker Creek, July 24, 1902, Macoun, Nos. 78747 and 78748; Dawson, July 15 and 16, 1902, idem, Nos. 78745 and 78746; Yukon, Eastwood, No. 524; McQuesten Lake, Cockfield, Can, No. 97686; Ranch Valley, Gorman, No. 1170.

The specimens cited above are inseparable from *P. occidentale* of the Canadian Rockies, although Hultén, l.c., has referred them to *P. acutiflorum* from which they differ by their much smaller flowers which in life are purple rather than sky-blue. In habit the plant is more strict with a narrower inflorescence, and unlike *P. acutiflorum* the entire plant is somewhat glandular-viscid.

Polemonium pulcherrimum Hook.; Hult., Fl. Al. and Yukon **8** : 1320 (1948).

Dry, sandy and shaly hillsides of Lewes River above Whitehorse, No. 9217, flowering specimens on June 1-5; Rose-Lapie Pass, Mile 102, meadows and grassy slopes near headwaters of Lapie River, elevation 3,600 feet, fruiting specimens on July 19, No. 10628; schist mountain east of Lapie Lake, Mile 105, on cliffs by waterfall, No. 10923; same place, grassy slope, No. 9409; Pelly River, vicinity of Ross River trading-post, No. 9695.

A very variable species which is common on dry, sandy and gravelly places on calcareous schists and shales on the Lewes and Pelly Rivers and in the north end of Rose-Lapie Pass. It flowers very early and by mid-July had gone to seed.

The collections listed above have funnel-shaped corollas, about 1·0 cm. long, and rather broad calyx lobes, about 0·4 cm. long, and white anthers. The basal leaves are well developed and numerous, with leaflets about 0·7 cm. long. The entire plant is glandular-viscid and somewhat fetid, especially above.

A second series of plants, *P. rotatum* Eastw., which are not too well separated from those cited above, differ chiefly by their larger corollas which average about 1·6 cm. in length, with the yellow tube free from the calyx. In life the corolla lobes sometimes are reflexed so that the corollas become rotate; this condition lasts a very short time when they again become funnel-shaped. The anthers are white and the stigmas exserted. The basal leaves are very variable; thus the earliest leaves are very short, with leaflets 0·3 to 0·4 cm. long, whereas in the fully developed leaves the leaflets are from 0·5 to 0·7 cm. long. The whole plant is glandular viscid and somewhat fetid.

Rose-Lapie River pass, Mile 105, schist mountain east of lake, grassy slopes 4,000 feet, No. 9379; lower Lapie River, Mile 132, dry shaly slopes of mountain west of road, elevation 5,000 feet, No. 9739; same place, No. 9449; not far from the last collection was found a small colony of white-flowered plants, No. 9450.

HYDROPHYLLACEAE

Phacelia Franklinii (R.Br.) Gray; Hult., Fl. Al. and Yukon **8** : 1327 (1948).

Whitehorse, among willows on river-banks, Nos. 9216 and 10697; Johnson Crossing, M. P. Porsild, Nos. 473 and 637; west bank of Nisutlin River, in rich woods near Mile 36, No. 10846; Pelly River valley, along a bulldozer road near Mile 136, No. 9858.

A somewhat rare species of rich woodland but rapidly and widely spreading in recent clearing and along new roads. See notes pp. 34-5.

In the Pelly Valley, *Phacelia Franklinii* flowered on June 23 and on the Nisutlin River had mature fruits on July 23.

Phacelia mollis McBride, in Contr. Gray Herb. N. Ser. **49** : 39 (1917); Hult., Fl. Al. and Yukon **8** : 1328 (1948).

This rare and little known species apparently is endemic to central Yukon where it has been collected only a few times: Coffee Creek, Yukon River, Eastwood, No. 551A (Type, in G.); below Selwyn River, Tarleton, No. 145 (US); between Selkirk and White River, August 1916, D. D. Cairnes, Can, No. 91878, and 141st Meridian, Ladue Valley, 1910, Eaton (US).

Phacelia sericea (Grah.) A. Gray ssp. **eu-sericea** var. **caespitosa** Brand in Pflanzenr., 4, **251** : 107 (1913).

Dawson Range, 62° N., 138° W., rocky slope, elevation 5,500 feet. Bostock, No. 10.[1]

A Cordilleran plant not previously recorded from Yukon.

BORAGINACEAE

Cynoglossum boreale Fern. in Rhod. **7** : 250 (1905).

Liard Hot Springs, B.C., near Yukon border, Porsild, No. 9100.

Lappula Myosotis Moench; Hult., Fl. Al. and Yukon **9** : 1345 (1949).

Introduced in the Dawson District and along the Alaska Highway.

Lappula Redowskii (Hornem.) Greene var. **occidentalis** (Wats.) Rydb. in Contr. U.S. Nat. Herb. **3** : 170 (1895).

L. Redowskii Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2**, 6 : 180 (1901).

Whitehorse, shaly bluffs and hillsides east of Lewes River, No. 9219; Quiet Lake, clearings in densely wooded east slope, Mile 55-60, No. 11129; Pelly River valley, vicinity of Ross River trading-post, No. 9696. Also Dawson, Malte, No. 53; Alaska Highway, Mackintosh, Anderson and Brown, No. 10055; Mayo, Anderson, No. 9509.

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[1] Determination by Dr. Lincoln Constance.

Although perhaps indigenous to the flora, this plant is undoubtedly spread epizoically by man, for which its spiny nutlets make it well suited. It flowered at Whitehorse on June 7 and on the Pelly River had mature fruits on June 16.

Eritrichium aretioides (Cham. & Schlecht.) DC. Prod. **10** : 125 (1846); Hult., Fl. Al. and Yukon **9** : 1347 (1949).

This rare plant was recently recorded from mountains along the 141st Meridian and from the arctic coast of Yukon (Porsild). A third collection, from Ogilvie Mountains near the Alaska-Yukon Boundary, was added by E. & J. Lohbrunner, July 16-17, 1936 (Can).

Eritrichium splendens Kearney in Wight in Bull. Torr. Bot. Cl. **29** : 410 (1902); Hult., Fl. Al. and Yukon **9** : 1350 (1949).

Of this very rare plant, long known only from a few stations in mountains of central and northwestern Alaska, there is a collection in the National Herbarium of Canada which perfectly matches the type. It comprises two flowering specimens and was collected by D. D. Cairnes along the Alaska-Yukon Boundary, in latitude 62° 05′, July 8, 1913, at an elevation of 6,000 feet.

Plagiobothrys cognatus (Greene) Johnst.; Hult., Fl. Al. and Yukon **9** : 1351 (1949).

Roadsides at Dawson, Macoun, Can, No. 78738.

Amsinckia lycopsoides Lehm. in DC. Prod. **10** : 117 (1846); Hult., Fl. Al. and Yukon **9** : 1353 (1949).

Undoubtedly introduced in Yukon where it has been collected at Dawson, Malte, No. 349, and at Whitehorse.

Amsinckia Menziesii (Lehm.) Nels. & McBride; Hult., Fl. Al. and Yukon **9** : 1353 (1949).

Introduced at Dawson.

Myosotis alpestris Schm. ssp. **asiatica** Vestergr. in Hult., Fl. Kamtchatka 4 : 80 (1930); Hult., Fl. Al. and Yukon **9** : 1354 (1949).

M. sylvatica var. *alpestris* sensu J. M. Macoun in Geol. Surv., Canada, Mem. **67** : 17 (1914).

Upper Rose River, alpine slopes west of Mile 95, elevation 5,000 feet, No. 10222; Rose-Lapie Pass, alpine summit east of Mile 105, Nos. 9411 and 10924; southwest slope of mountain west of Mile 116, No. 10077; lower Lapie Crossing, dry shaly slopes west of Mile 132, No. 9741; same place, in a small colony, No. 9742 (f. *albiflora*); south shoulder of Mount Sheldon, grassy slopes above timber-line, No. 11632; south fork of Macmillan River, alpine slopes west of Mile 268, No. 11368. Also noted in Macmillan Pass.

A common species which is characteristic of alpine herbmats and snowflushes above timber-line throughout the Yukon to the Arctic Coast. Its very showy and exquisitely perfumed flowers were first noted in Rose-Lapie Pass on June 11 but may be seen near alpine snowbanks throughout the summer. Flowering specimens with mature fruits were collected on July 21. In the Pelly Range it ascends to 6,000 feet.

Mertensia maritima (L.) S. F. Gray, Nat. Arr. Brit. Pl. **2** : 354 (1821); Ostf. Gjöa Exp. 63 (1909); Hult., Fl. Al. and Yukon **9** : 1358 (1949).

A littoral species which in Yukon has been collected a number of times along the Arctic Coast.

Mertensia paniculata (Ait.) G. Don. Gen. Hist. **4** : 318 (1838); Williams in Ann. Mo. Bot. Gard. **24** : 42 (1937); Hult., Fl. Al. and Yukon **9** : 1359 (1949).

M. pilosa Ostf. Gjöa Exp. 63 (1909).

Whitehorse, open spruce forest east of Lewes River, No. 9218; lower Lapie Crossing, in rich poplar woods near Mile 132, Nos. 9524 and 9842; dry shaly slopes west of Mile 132, No. 9743; south shoulder of Mount Sheldon, grassy slopes and open fir forest near timber-line, No. 11631.

A common lowland species of rich woods, river-banks, and peaty soils but occasionally ascending above timber-line and extending north to the Arctic Coast. On Mount Sheldon to 5,600 feet.

At Whitehorse, *Mertensia paniculata* was in full flower on June 1, but flowering specimens could be found throughout the summer.

Mertensia paniculata var. **alaskana** (Britt.) Williams in Ann. Mo. Bot. Gard. **24** : 48 (1937); Hult., Fl. Al. and Yukon **9** : 1362 (1949).

M. alaskana Britt. in Bull. N.Y. Bot. Gard. **2** : 181 (1901).

Pass between Teslin and Nisutlin Rivers, on alpine snowflushes, Mile 14, Nos. 11046 and 11154, where it grew together with the main species.

The var. *alaskana* is not too well distinguished by its usually glabrous lower leaf surfaces and calyx lobes. By Williams, l.c., reported from a number of stations in the Dawson District.

LABIATAE

Dracocephalum parviflorum Nutt.; Macoun, Ott. Nat. **13** : 215 (1899); Britt. & Rydb., Bull. N.Y. Bot. Gard. **2** : 181 (1901); Hult., Fl. Al. and Yukon **9** : 1364 (1949).

Johnson Crossing, in a wood, M. P. Porsild, No. 428; lower Lapie Crossing, along bulldozer trail in a muskeg near Mile 132, No. 9841. Previously collected in the Dawson District and along Yukon River.

Our specimens had not yet reached flowering on June 22 and probably were a recent introduction.

Mentha canadensis L. var. **glabrata** Benth. in DC. Prod. **12** : 173 (1848).

McArthur Range, Hot Springs, latitude 63° 55′, longitude 135° 50′, Bostock, Nos. 115 and 185.

Scutellaria epilobiifolia A. Ham., Monogr. Scut. 32 (1832).

S. galericulata Hult., Fl. Al. and Yukon **9** : 1363 (1949).

Mayo, edge of lake, Anderson, No. 9796 (Can).

SCROPHULARIACEAE

Collinsia parviflora Dougl.; Hult., Fl. Al. and Yukon **9** : 1370 (1949).

Dawson's collections from Telegraph Creek and Glenora, both in northern British Columbia, are the basis of Hultén's recording of *Collinsia parviflora* from "Upper Yukon R. distr." The species thus should be excluded from the flora of Yukon.

Penstemon Gormani Greene in Ott. Nat. **16** : 39 (1902); Hult., Fl. Al. and Yukon **9** : 1371 (1949). (Plate XXV)

Whitehorse, shaly bluffs east of Lewes River, No. 9221; lower Lapie River crossing, sandy river terraces near Mile 132, Nos. 9281 and 9555; dry shaly slopes of mountain west of Mile 132, No. 9745; same place, No. 9672 (forma *albiflora*). Also from the Mayo District, the Dawson region, and Lake Kluane.

Penstemon Gormani apparently is an endemic of the upper and central Yukon Basin where it is common on calcareous sandy and shaly riverbanks and slopes. The following description is from live specimens growing at Lapie Crossing:

Perennial with an ascending rather stout rootstock which is freely branched above the ground, with sterile rosettes each bearing 6 to 10 leaves; basal leaves, 6 to 10 cm. long, oblanceolate entire, or sometimes distinctly serrate, blade gradually tapering below into long, very narrow petioles; cauline leaves usually 3 pairs, sessile, connate, tapering toward the tip; all leaves dark green, somewhat leathery glabrous and with a strong midvein; stems 20 to 30 cm. high, erect or ascending, glabrous below and strongly suffused with red, pubescent above the lowermost leafy bracts with long, multicellular, white, gland-tipped hairs; inflorescence elongate, paniculate bearing opposite 3- to 6-flowered fascicles; calyx short, saucer-shaped, densely hirsute with white, glandular hairs, the teeth green, linear, 3 to 4 mm. long; corolla 2·5 cm. long, funnel-shaped with dilated lobes, 1·7 cm. in diameter, glandular pubescent on the outside; the unequal lobes deep blue when first expanded, but after a few days fading to light purple; the tube pale purple, with 10 to 11 narrow purple stripes on the ventral side; the throat bearing a fringe of long yellow hairs below, naked above; sterile upper 5th stamen adnate one-fifth of its length, on its dorsal side bearing a brush or comb of upward- and forward-turned hairs, its upper part bent so that the tip rests on the lower corolla lobe; fertile stamens 2 on each side, from the point of attachment curved up and around inside of tube so as to leave a central passage; the anthers are close together at the upper roof of throat, 2-celled and bilobed; pistil curved so that the stigma is placed between the 2 pairs of anthers; mature capsules ovoid, acuminate 8 to 10 mm. long; seeds angular, coal black, 2 mm. long.

Penstemon Gormani flowers from early June; the showy flowers are very fragrant and are visited by several kinds of insects. A white-flowered form (f. *albiflora* n. forma: corollis albis) was seen occasionally together with the typical purple-flowered plant.

Penstemon procerus Dougl. ex Grah. in Edinb. N. Phil. Journ. July, 1829, p. 348; Hult., Fl. Al. and Yukon **9** : 1371 (1949).

Whitehorse, shaly hillsides east of Lewes River, Nos. 9220 and 10699; west bank of Nisutlin River, grassy flood-plain meadows near Mile 36, No. 10850; Rose-Lapie Pass, sandy slopes near headwaters of Rose River, Mile 102, No. 10629; lower Lapie River, dry, shaly slopes of mountain west of Mile 132, No. 9487. Alaska Highway at Haines Junction, Clarke, Nos. 346 and 347.

A Cordilleran species which in Yukon has approximately the same range as *P. Gormani*. It prefers sandy and gravelly places such as river-flats. At Whitehorse, flowers were noted on June 7 and mature fruits on July 28.

Mimulus guttatus DC., Cat. Hort. Monsp. 127 (1813).

In the National Herbarium of Canada is a single Yukon collection from Whitehorse near Rapids, John Macoun, Can, No. 91093. Along Haines Road *Mimulus guttatus* was collected on the British Columbia side of the border, Kleheni River, Clarke, No. 416.

Limosella aquatica L., Sp. Pl. 631 (1753).

Ross Valley, Sheldon Lake, very rare on muddy west shore just above water's edge, No. 11578.

Flowering and fruiting specimens on August 16.

The collection constitutes a very considerable extension of the known range of this rare aquatic, the nearest known stations of which are Seward Peninsula, Alaska, Great Bear and Athabasca Lakes.

Veronica alpina L. var. **alterniflora** Fern. in Rhod. **41** : 455, tab. 567 (1939);[1] Porsild in Nat. Mus., Canada, Bull **101** : 25 (1945).

Upper Rose River, gravelly river-flat near Mile 95, No. 10405; same place, on glacial outwash plain, No. 10443; Rose-Lapie Pass, in subalpine meadow near headwaters of Rose River, Mile 98, No. 11911 (Type of f. *albiflora*: corollis albis); in alpine meadow near Mile 105, No. 9810; Ross River valley, in meadows near north end of Sheldon Lake, Mile 222, No. 11577; south fork of Macmillan River, grassy river-banks near Mile 250, No. 11436. The following Yukon collections in the National Herbarium also belong here: Lake Bennett, John Macoun (Can, No. 91114); Mayo District, McArthur Range, Bostock, Nos. 117 and 184; Rambler Hill, McQuesten Lake, Cockfield (Can, No. 97707); north fork of Klondike River, Cockfield, No. 57.

See notes under following.

Veronica alpina L. var. **unalaschcensis** Cham. & Schlecht. in Linnaea **2** : 556 (1827); Fernald in Rhod. **41** : 450, tab. 564 (1939).

V. Wormskioldii Hult., Fl. Al. and Yukon **9** : 1380 (1949).

Pass between Teslin and Nisutlin Rivers, alpine slopes near snow-flushes, elevation 5,000 feet, Mile 14, No. 11047; same place, in subalpine meadow in pass, No. 11152; west bank of Nisutlin River, flood-plain meadows near Mile 36, No. 10852; Rose River, in pine and spruce bogs near Mile 77, No. 10318; upper Rose River, by alpine brook west of Mile 95, elevation 5,600 feet, No. 10579 (Type of f. *albiflora*) n. forma: corollis albis). Also from hills north of Finlayson River, latitude 61°, July 20 and 27, 1887, Wm. Dawson (Can, Nos. 17765 and 101526).

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[1] Determination of the series of *Veronica alpina* was kindly verified by Professor M. L. Fernald.

As shown by the present series, the var. *alterniflora* and var. *unalaschcensis* are more variable than suggested by Fernald's treatment, l.c., and a number of specimens can be referred to either variety; nor do they appear quite so "strongly marked geographical varieties" when large series are examined.

In southeast Yukon, the var. *alterniflora* tends to be less alpine and more continental. It was found in the northern part of the area where it was most often growing in flood-plain meadows. As pointed out by Fernald, the leaves of var. *alterniflora* usually dry green, unless artificial heat is used when they, too, tend to blacken. The var. *alterniflora* usually is taller than var. *unalaschcensis*, even in anthesis, and fruiting specimens sometimes measure 45 cm. (No. 11577).

The var. *unalaschcensis*, in southeast Yukon, appears to be more strictly alpine and was restricted to the southern part of our area where it was found most commonly near or above timber-line.

White-flowered forms occur in both varieties. First flowers were noted by end of June and mature fruits, a month later.

Veronica americana Schwein. in Benth. in DC. Prod. **10** : 468 (1846).

Nisutlin River, in muddy places by a small creek west of Mile 42, No. 10853; northeast spur of Mount Sheldon, shelving bank of sinkhole in subalpine meadow near Mile 226, No. 11490. Also from McArthur Mountains, at the Hot Springs, Bostock, No. 191.

A southern species which in southeast Yukon is rare and restricted to relic grassland. It had mature fruits on July 23 on Nisutlin River but on Mount Sheldon was still in flower on August 4.

Veronica peregrina L. var. **xalapensis** (H.B.K.) Pennell in Torreya **19** : 167 (1919); Hult., Fl. Al. and Yukon **9** : 1377 (1949).

Dawson by roadsides, J. Macoun, Can, No. 91115.

Veronica scutellata L., Sp. Pl. 12 (1753); Pennell in Phil. Acad. Nat. Sci. Mon. **1** : 373 (1935); Hult. Fl. Al. and Yukon **9** : 1378 (1949).

Johnson Crossing, in wet meadows among sedges, M. P. Porsild, Nos. 551 and 611; northeast spur of Mount Sheldon, shelving banks of sinkholes in subalpine meadows near Mile 226, with *V. americana*, No. 11489.

Flowering specimens on August 4. A rare southern species in Yukon where it was previously known from a few stations on the upper Yukon: Ranch Valley, Gorman, No. 1080; mouth of Stewart River, R. T. Porsild, June 28, 1939 (both Can).

Lagotis Stelleri (Cham. & Schlecht.) Rupr., Fl. Samojed. Cis. 49, No. 214 (1845); Porsild in Rhod. **41** : 282 (1939); idem, Sargentia, **4** : 62 (1943).

Gymnandra Stelleri Hook., Fl. Bor.-Am. **2** : 102 (1838).

Lagotis glauca Ostenf., Gjöa Exp. 66 (1909).

L. glauca var. *Stelleri* Macoun & Holm in Rept., Can. Arct. Exp. **5A** : 20 (1921); Hult., Fl. Al. and Yukon **9** : 1383 (1949).

To Yukon stations on the Arctic Coast listed by Porsild, l.c., should be added: Mayo District, Keno, Mrs. Black (Can, No. 119354); McArthur

Range, latitude 63°, longitude 136°, Bostock, No. 227; Hot Springs, idem, No. 187; north fork of Klondike River, Cockfield, No. 60; Alaska-Yukon boundary, 65° 58′ and 63° 50′, Cairnes, and Klotassin area, idem (Can, No. 91874), all in the National Herbarium of Canada.

Synthyris borealis Pennell in Proc. Acad. Nat. Sci. Phil. **85** : 88, fig. 1 (1933); Hult., Sv. Bot. Tidskr. **30** : 527 (1936); idem, Fl. Al. and Yukon **9** : 1385 (1949).

To the four known stations given by Pennell and by Hultén, l.c., for this rare and little known plant should be added a second Yukon station: north fork of Klondike River, elevation 4,500 feet, flowering specimens in last half of July 1919, Cockfield, No. 61 (Can).

The Klondike River specimens are much less hirsute than are either the type or a topotypical collection from Mount McKinley Park, Alaska, Nelson & Nelson, No. 4125 (G). In the Yukon plant the leaves are merely villous along the margins, whereas the petioles and the lower part of the stem are almost entirely glabrous.

Castilleja hyperborea Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 532 (1934); Porsild in Rhod. **41** : 284 (1939); idem. Sargentia **4** : 63 (1945); Hult., Fl. Al. and Yukon **9** : 1388 (1949).

Southwest Yukon: Dawson Range, latitude 62°, longitude 138° W., Bostock, No. 12; south end of Kluane Lake, Anderson, No. 9465; north end of Kluane Lake, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 275. Dawson District: head of Coal Creek along Yukon River, Osgood (US); Mayo District; McQuesten Lake, Cockfield, Can, No. 97683; Alaska–Yukon Boundary, latitude 67° N., Nelles, No. 37.

A rare alpine species which, thus far, is known only from unglaciated parts of Alaska, Yukon, and northwest Mackenzie. We did not see it in southeastern Yukon, although we searched for it on all high mountains climbed along the Canol Road.

Castilleja Muelleri Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 533 (1934); Hult., Fl. Al. and Yukon **9** : 1389 (1949).

Thus far known only from the type collection: Lake Kluane to Donjek River, August 11-27, 1920, A. Müller, in Herb. Acad. Nat. Sci. Phil.

Castilleja pallida (L.) Spreng. ssp. **elegans** (Ostf.) Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 526 (1934); Hult., Fl. Al. and Yukon **9** : 1391 (1949).

C. elegans Ostf. in Malte, in Rhod. **36** : 787 (1934).

C. pallida var. *unalaschcensis* Ostf. Gjöa Exp. 64 (1909).

In Yukon thus far collected only along the Arctic Coast but recorded from the east slope of Mackenzie Mountains along Canol Road; it is probably common in mountains of northern Yukon.

Castilleja pallida (L.) Spreng. ssp. **caudata** Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 524 (1934); Porsild, Sargentia **4** : 63 (1943); Hult., Fl. Al. and Yukon **9** : 1390 (1949).

Perhaps a common alpine species of the Arctic Coast and unglaciated parts of Yukon and Alaska. In addition to the Yukon stations cited by

Pennell, l.c., it has recently been collected in southwestern Yukon along the Alaska Highway near the Alaska border, Anderson, Nos. 9120 and 9337 (Can).

Castilleja Raupii Pennell ssp. **typica** Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 528 (1934).

An endemic species of continental northern Canada which, according to Pennell, barely extends into Alaska and Yukon (Yukon River above Dawson and Indian River).

Castilleja unalaschcensis (Cham. & Schlecht.) Malte in Rhod. **36** : 187 (1934), as to name-bringing synonym, not as to plant described. *See* Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 536 (1934).

C. unalaschcensis ssp. *transnivalis* Pennell, l.c., 537; Hult., Fl. Al. and Yukon **9** : 1395 (1949).

Johnson Crossing, M. P. and R. T. Porsild, No. 694; pass between Teslin and Nisutlin Rivers, alpine meadows east of Mile 14, elevation 4,500 feet, No. 11048; same place, treeless meadow in pass, elevation 4,000 feet, No. 11153; Rose River valley, alpine slopes east of Mile 77, No. 10959; upper Rose River, in river meadows on flood-plain near Mile 95, No. 10406; Rose-Lapie Pass, in alpine meadow on mountain east of Mile 105, elevation 5,500 feet, No. 10927; also noted on Nisutlin River, Mile 39.

Occasional to common in subalpine meadows through the Pelly Range north to Rose-Lapie Pass where flowering specimens were noted on July 3 and fruiting ones on July 30.

Most of the material in the present series belongs to ssp. *transnivalis*, which Pennell considers an inland race differing from the typical plant of the Pacific coast only in the more slender growth, smaller leaves, bracts, and corollas. These characters, however, do not seem to be too consistent, for the writer has before him several sheets from southeast Alaska that are a close match for the first four numbers of the Yukon series, whereas his No. 10927, from the Rose-Lapie Pass, is a perfect match for typical *C. unalaschcensis* from the type locality (Unalaska).

Castilleja villosissima Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 532 (1934); Hult., Fl. Al. and Yukon **9** : 1395 (1949).

Thus far known only from the type locality: Bear Creek, near Lake Dezadeash, August 6, 1920, A. Müller, in Herb. Acad. Nat. Sci. Phil.

Castilleja yukonis Pennell in Proc. Acad. Nat. Sci. Phil. **86** : 531 (1934); Hult., Fl. Al. and Yukon **9** : 1395 (1949).

A well-marked endemic of the upper Yukon Valley where it has been collected a number of times along the Yukon. In addition to the stations cited by Pennell, *C. yukonis* has recently been collected on lower Pelly River, 20 miles from its junction with the Yukon, Bostock, No. 186 (Can).

Euphrasia disjuncta Fern. & Wieg. in Rhod. **17** : 190 (1915).

E. americana Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 181 (1901), not Wettst.

Whitehorse, dry hillsides east of Lewes River, August 6, 1944, R. T. Porsild; in a meadow between Whitehorse and Miles Canyon, idem, No. 270; alluvial meadows on west bank of Nisutlin River near Mile 36, No. 10851; lower Lapie River, on gravelly river-flat near Mile 127, No. 10023

Our specimens have shorter internodes than have typical *E. disjuncta* but in every other respect are a close match for the type from Newfoundland. Comparison with *E. subarctica* Raup of the upper Mackenzie drainage shows that in our specimens the corollas are almost twice as large. The plant is distinctly glutinous-clammy in life.

On Nisutlin River, *E. disjuncta* was very common in dry river meadows where flowering and fruiting specimens were collected on July 23.

Euphrasia subarctica Raup in Rhod. **36** : 87 (1934); Hult., Fl. Al. and Yukon **9** : 1398 (1949).

By Hulten, l.c., reported from several stations on the upper Yukon and from Kluane Lake.

Rhinanthus groenlandicus Chab. in Bull. Herb. Boiss. **7** : 515 (1899).
R. minor L. ssp. *groenlandicus* Hult., Fl. Al. and Yukon **9** : 1399 (1949).

Whitehorse, Miles Canyon, R. T. Porsild, No. 273; idem, dry slopes east of Lewes River, August 6, 1944; also from Alaska Highway, junction Haines Road, Clarke, No. 348.

These collections close a hiatus in the known range of this species between Alaska and British Columbia–Northwest Territories.

Pedicularis arctica R.Br., Chlor. Melv. 22, 1823. *See* Simmons Fl. Ellesmereland, 31-34, 1906; Ostenf., Gjöa Exp. 66 (1909); Porsild, Sargentia **4** : 64 (1943).

P. Langsdorffii Hult., Fl. Al. and Yukon **9** : 1409 (1949), as regards Yukon plant.

Pass between Teslin and Nisutlin Rivers, alpine slopes near summit of mountain east of Mile 14, elevation 6,000 feet, No. 11008; Rose-Lapie Pass, alpine tundra slopes on mountain east of Mile 105, elevation 5,600 feet, No. 9410; lower Lapie River crossing, grassy summit south of Mile 132, elevation 5,600 feet, Nos. 9630 and 9945; moist, alpine north slope near summit of mountain west of Mile 132, No. 9744. Also noted in Rose-Lapie Pass at Mile 105. In Yukon *P. arctica* has been recorded previously from the Arctic Coast. Additional stations from the interior are: Mayo District, Keno, June 20-28, 1927, Mrs. Geo. Black; Alaska-Yukon Boundary, latitude 63° 50′, C. E. Cairnes (Can, No. 93330); mountain slope west of Kluane Lake, Clarke, No. 272. In recent years it has been collected a few times on high mountains of Alberta and British Columbia.

An arctic-alpine species which in the interior of Yukon and Alaska is restricted to high mountains. Its distribution even here is spotty, although sometimes locally abundant. At Lapie Crossing it flowered at 5,600 feet on June 15 and June 26; the earliest specimens had almost mature fruits.

Pedicularis capitata Adams in Mem. Soc. Imp. Nat., Moscou **5** : 100 (1817); Ostf., Gjöa Exp. 65 (1909); Hult., Fl. Al. and Yukon **9** : 1402 (1949).

Rose-Lapie Pass, in alpine tundra on summit east of Mile 105, No. 9345; lower Lapie Crossing, grassy summit south of Mile 132, elevation 5,600 feet, No. 9629; south shoulder of Mount Sheldon, on rocky ledges at 7,200 feet, No. 11633. Also known from McArthur Range, 63° 40′ N. and 134° 20′ W., Bostock, Nos. 121 and 122; Alaska-Yukon Boundary, 65° 58′ N., D. D. Cairnes (Can, No. 83062); 64° N., C. E. Cairnes (Can, No. 93331); alpine slopes west of Burwash Landing, Lake Kluane, Clarke, No. 271.

An arctic-alpine species which in Yukon is common on the Arctic Coast and on high mountains of the interior. On Mount Sheldon it ascends to 7,200 feet. In the Pelly Range, *P. capitata* flowered on June 15, and first mature fruits were noted a month later.

Pedicularis labradorica Wirsing, Ecolog. Bot. tab. 10 (1778); Hult., Fl. Al. and Yukon **9** : 1405 (1949).

Whitehorse, in sandy pine woods east of Lewes River, No. 9222; Rose-Lapie Pass, in mossy timber-line spruce woods, Mile 105, Nos. 9346 and 9347; upper Rose River, in alder thicket on steep granite slope east of Mile 95, No. 10522; Pelly River valley, in black spruce muskeg near Mile 136, No. 9674.

A common species of muskegs and mossy, subalpine woods throughout the Yukon, and along the Canol Road noted from all stations north to Macmillan Pass. At Lapie River crossing flowering from June 17; on Mount Sheldon ascending to 6,100 feet.

Pedicularis lanata Cham. & Schlecht. in Linnaea **2** : 583 (1827); Ostf., Gjöa Exp. 65 (1909); Hult., Fl. Al. and Yukon **9** : 1407 (1949).

Rose-Lapie Pass, alpine tundra on mountain east of Mile 105, No. 9349; lower Lapie River crossing, grassy summit of mountain south of Mile 132, elevation 5,600 feet, Nos. 9423, 9628, and 9944. In addition, the following specimens from interior Yukon are in the National Herbarium of Canada: Dawson Range, 62° 30′ N., 138° W., Bostock, Nos. 11 and 273; McArthur Range, 64° N., 134° 30′ W., idem, No. 123; north fork of Klondike River, Cockfield, No. 59; Alaska-Yukon Boundary, 67° 13′ N., D. D. Cairnes, No. 52; idem, 66° 10′ N.; Kluane Lake, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 273.

Noted by us only on two peaks of the Pelly Range where it was very common locally at 5,600 feet and flowered on June 11. First fruiting specimens noted on June 26.

Pedicularis Oederi Vahl in Hornem., Forsög til Dansk Oeconom. Plantelaere **1**:580 (1806); Hult., Fl. Al. and Yukon **9**:1411 (1949).

P. flammea J. M. Macoun in Geol. Surv., Canada, Mem. **67** : 17 (1914).

Dawson Range, about 62° N., 138° W., elevation 4,500 to 5,000 feet, Bostock, Nos. 29, 275, and 276; same place, Klotassin River, D. D. Cairnes (Can, No. 91875); Lake Kluane, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 270; Yukon-Alaska Boundary, 65° 58′ N., D. D. Cairnes (Can, No. 83062); 67° N., Nelles, No. 27.

A rare species in Yukon where it appears to be restricted to the western, unglaciated parts.

Pedicularis parviflora Sm. apud Rees; Hult., Fl. Al. and Yukon **9** : 1413 (1949).

Hultén, l.c., reports a single Yukon collection from Lake Nares, near Carcross.

Pedicularis sudetica Willd., Sp. Pl. **3** : 209 (1800); Hult., Fl. Al. and Yukon **9** : 1415 (1949).

Whitehorse, in a muskeg east of Lewes River, No. 10698; Rose River valley, in pine bogs near Mile 77, No. 10317; same place, alpine slopes above timber-line, No. 10957; Rose-Lapie Pass, on wet alpine slope east of Mile 105, No. 9348; Pelly River valley, in marshy place by lake shore near Mile 136, Nos. 9647, 9673, and 9785; south shoulder of Mount Sheldon, in a ravine above timber-line, elevation 4,500 feet, No. 11634.

A common species throughout Yukon in lowland muskegs, wet flood-plain meadows, and in mossy, subalpine forest; noted or collected at all stations north to Macmillan Pass. On Mount Sheldon ascending to 6,100 feet. In Pelly Valley, flowering specimens were first noted on June 16.

Pedicularis verticellata L., Sp. Pl. 608 (1753); Ostf., Gjöa Exp. p. 65 (1909); Hult., Fl. Al. and Yukon **9** : 1418 (1949).

Dawson Range, 62° 40′ N., 138° W., Bostock, No. 274; Lake Kluane, Burwash Landing, Clarke, No. 184.

A western species which barely enters Yukon in the southwest and along the Arctic Coast, where it extends east to the Mackenzie Delta.

OROBANCHACEAE

Boschniakia rossica (Cham. & Schlecht.) Fedtsch. in Fedtsch. & Fler. Fl. Eur. Ross. 896 (1910); Hult., Fl. Al. and Yukon **9** : 1421 (1949).

Lower Lapie River crossing, in mossy spruce and birch forest west of Mile 132, No. 9431; same place, in black spruce muskeg, Nos. 9970 and 10040; southeast slope of Mount Sheldon, in alder thicket at 4,500 feet, No. 11729. Also from north side of McArthur Range, Bostock, No. 183; Bonanza Creek, Macoun, Can, No. 91245; Mayo District, 1948, G. MacIntyre.

Parasitic on the roots of *Picea glauca, Alnus crispa, Salix reticulata Chamaedaphne calyculata,* and, according to Hultén, l.c., also on *Betula* and *Vaccinium.*

Orobanche fasciculata Nutt. in Gen. Am. **2** : 59 (1818); Hult. Fl. Al. and Yukon **9** : 1420 (1949).

Whitehorse, very scarce on sunny, shaly east bank of Lewes River where it was parasitic on the roots of *Artemisia frigida,* No. 10700; same place, July 31, 1944, R. T. Porsild.

A very rare prairie-foothill species previously collected only twice in the Yukon, near Fort Selkirk.

LENTIBULARIACEAE

Pinguicula villosa L. Sp. Pl. 17 (1753); Hult., Fl. Al. and Yukon **9** : 1422 (1949).

Lower Lapie River crossing, in sphagnum in spruce muskeg near Mile 132, Nos. 9590 and 9971; in mossy lower slopes of Mount Sheldon near Mile 222, No. 11095. Also from Mayo District, Ladue Valley, Bostock, No. 124; Bonanza Creek, Dawson, J. Macoun, (Can, No. 54268); Dawson, June 14, 1899, R. S. Williams; 141st Meridian, July 10, 1912, D. D. Cairnes; and Frances River, 61° N., Dawson, (Can, No. 17873).

Rare to occasional in spruce muskegs where, as elsewhere, it grows exclusively on sphagnum hummocks. On Lapie River, it flowered on June 17, and on Mount Sheldon the mature capsules were open on August 13.

Pinguicula vulgaris L., Sp. Pl. 17 (1753).

It is strange that this species, which is common in adjacent Mackenzie District and was collected along the Canol Road on the east slope of Mackenzie Mountains, N.W.T., was not seen by us in southeastern Yukon; nor has it to my knowledge been collected elsewhere in the Yukon, although it is known from numerous stations in Alaska, including several along the Yukon River, near the Yukon border. It may thus be expected to turn up in the Ogilvie Range and in the mountains of northern Yukon.

Utricularia intermedia Hayne in Schrad. Journ. Bot. **1** : 18 (1800); Hult., Fl. Al. and Yukon **9** : 1426 (1949).

Alaska Highway, Mile 1210, Anderson and Brown, No. 10101. Also fragments unquestionably of this species, as well as of *U. minor*, were noted on a sheet of *U. vulgaris* var. *americana*, collected on Alaska Highway near the Canadian border, Anderson, No. 9166. Also collected at Liard Hot Springs, B.C., Clarke, No. 89.

Utricularia ochroleuca Hartm. in Bot. Not. 30 (1857).

Liard Hot Springs, B.C., just south of Yukon border, No. 9102. In North America otherwise known from Mackenzie Delta and the Gulf of St. Lawrence (*See* Porsild, Sargentia 4 : 65-66 (1943)).

Utricularia minor L., Sp. Pl. 18 (1753); Hult., Fl. Al. and Yukon **9** : 1427 (1949).

Dawson district, Bonanza Creek, J. Macoun, (Can, No. 91243) mixed with *U. vulgaris* var. *americana*; Alaska Highway near Canadian border, Anderson, No. 9166 (Can), mixed with *U. vulgaris* var. *americana* (*See* above). Also Alaska Highway, Mile 1226, Alaska, Anderson, No. 9125.

Utricularia vulgaris L. var. **americana** Gray, Man. ed. **5** : 318 (1867).

U. vulgaris Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 182 (1901).

U. macrorhiza Hult., Fl. Al. and Yukon **9** : 1426 (1949).

Ponds west of Nisutlin River, Mile 36, Nos. 10848 and 10854; Pelly River valley, in shallow, marly lake near Mile 136, Nos. 9646 and 11175; Ross Valley, in sloughs near north end of Sheldon Lake, Nos. 11579 and 11580. In the National Herbarium of Canada are additional specimens from Dawson District, J. Macoun (Can, Nos. 91243 and 91244); Mayo District, Anderson, No. 9795.

A late-flowering species which, along the Canol Road, perhaps rarely matures fruits. On the Pelly River, new growth had barely commenced on July 7. Flowering specimens were collected on the Nisutlin on July 23, and at Sheldon Lake on August 1.

PLANTAGINACEAE

Plantago aristata Michx.; Hult., Fl. Al. and Yukon **9** : 1428 (1949).

An introduced weed collected, once, at Dawson.

Plantago eriopoda Torr.; Hult., Fl. Al. and Yukon **9** : 1429 (1949).

In Yukon recorded from Atlin Lake and from Alaska Highway, Mile 988.

Plantago major L., Sp. Pl. 112 (1753); Hult., Fl. Al. and Yukon **9** : 1430 (1949).

Johnson Crossing, introduced by roadsides, M. P. Porsild, No. 759. A common weed near towns and settlements.

Plantago major L. var. **asiatica** (L.) Decaisne in DC. Prod. **13**, 1 : 694 (1852).

Dawson District: Islands in the Klondike River, John Macoun, Can, No. 91242. As pointed out by Raup in Sargentia **6** : 234 (1947), the taxonomic status of *P. major* var. *asiatica* is not clear. The fact remains, however, that in the Mackenzie Basin, and probably also along the Yukon, it is decidedly a component of the aboriginal flora.

Plantago septata Morris in Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 182 (1901).

P. canescens Hult., Fl. Al. and Yukon **9** : 1428 (1949).

Pelly River valley, on dry hillsides, Bostock, No. 192; Yukon River, Dry Gulch, Gorman, No. 1010; Rink Rapids, J. Macoun, No. 91241; Alaska Highway, Mile 1022, Anderson and Brown, No. 10052; Kluane Lake, Clarke, No. 188.

Not seen by us along Canol Road.

RUBIACEAE

Galium boreale L., Sp. Pl. 108 (1753); Hult., Fl. Al. and Yukon **9** : 1434 (1949).

Lower Lapie Crossing, dry shaly lower slopes of mountain west of Mile 132, No. 9871; upper Pelly River, 61° N., Dawson (Can, No. 9732).

A foothill species of dry, sunny slopes which is common throughout the forested parts of Yukon, and which was noted along the Canol Road at all stations north to Mount Sheldon. In the Pelly Range ascending to, or slightly above, timber-line. Flowering specimens were collected on June 25.

Galium palustre L., Sp. Pl. 105 (1753).

In flood-plain meadow west of Nisutlin River, Mile 30, near Sidney Creek, No. 10855. Horses had been grazed in the meadow, and the presence of clearly introduced species such as *Phleum pratense* suggests that *Galium palustre* might be a recent introduction. Our specimens had almost mature fruits on July 23.

Galium trifidum L., Sp. Pl. 105 (1753); Hult., Fl. Al. and Yukon **9**: 1437 (1949).

G. Brandegei, sensu Porsild, Rhod. **41** : 289 (1939) and Sargentia **4** : 66 (1943).

Johnson Crossing, M. P. Porsild, Nos. 464 and 568; Rose River, in alpine meadow east of Mile 77, No. 10960; Rose-Lapie River pass, at water's edge in wet *Carex* bog near Mile 98-99, No. 11912; in wet meadow near Mile 102, No. 10630; lower slopes of Mount Sheldon, in wet sphagnum in a muskeg near Mile 222, No. 11730. Also Mayo, Anderson, No. 9801 and Dawson District, August 11, 1902, J. Macoun.

Common to occasional, and noted at all lowland stations along the Canol Road north to Macmillan Pass, No. 11264.

The specimens listed above show very little variation, although in No. 11730 a few flowers are 4-merous, whereas in the rest they are 3-merous; the stems are mostly simple or little branched and strongly retrorse-scabrous. The flowers are mostly 1 or 2 together on rather short, glabrous or faintly scabrous peduncles.

The specimens in the present series, with those cited by the writer, l.c., from northwest Mackenzie and Alaska, and by him erroneously referred to *G. Brandegei*, are intermediate between *G. trifidum* and *G. Claytonii*.

Galium triflorum, Michx., Fl. Bor.-Am. 80 (1803).

Quiet Lake, steep, densely wooded slopes near Mile 55-60, No. 11121.

The species apparently is a rare one in Yukon where it does not appear to have been recorded previously, although it is known from central and southern Alaska and from adjacent British Columbia and Northwest Territories.

CAPRIFOLIACEAE

Viburnum edule (Michx). Raf. Med. Repos. Lex. II. **5** : 354 (1808); Hult. Fl. Al. and Yukon **9** : 1443 (1949).

Whitehorse, common in spruce forest east of Lewes River, No. 9223; upper Rose River, in old burns near Mile 95, No. 10471; Rose-Lapie Pass, at timber-line on mountain east of Mile 116, No. 11919; lower Lapie Crossing, edge of spruce forest near Mile 132, No. 9488; in rich poplar woods, same place, Nos. 9593 and 10041; Mount Sheldon, in wooded ravines on southeast slope, elevation 4,000 feet, No. 11732.

A woodland species of mossy spruce, poplar, and fir forests, common throughout the forested parts of Yukon and along the Canol Road, collected or noted north to Mount Sheldon where it fruited on August 3 at 4,000 feet. Flowering specimens were collected on Lapie River on June 14 where 8-foot bushes were found in a rich poplar wood.

Linnaea borealis L. var. **americana** (Forbes) Rehder in Rhod. **6** : 56 (1904); Hult., Fl. Al. and Yukon **9** : 1447 (1949).

Upper Rose River, open woods on river-flat near Mile 95, No. 10408; lower Lapie River crossing, in rich poplar woods near Mile 132, No. 9843; same place, No. 11995 (var. *typica*).

A ubiquitous species of open woods; along Canol Road noted at all stations north to Macmillan Pass, and in the Pelly Range ascending to well above the timber-line (5,600 feet). At Lapie River, *Linnaea* flowered from June 20.

Most of the material examined in the field is typical var. *americana*, but not infrequently plants may be seen with shorter, less funnel-shaped corollas, flaring from within the calyx (No. 11995); the latter, as pointed out by Fernald, Rhod. **24** : 211 (1922), are indistinguishable from European *L. borealis* L.

Lonicera glaucescens Rydb.; Hult., Fl. Al. and Yukon **9** : 1449 (1949).

Anderson's No. 9913 from Liard Hot Springs in northern British Columbia by Hultén, l.c., erroneously has been included in his "Upper Yukon R. distr." The species may turn up in Yukon but, at least for the present, should be excluded from the flora of Yukon.

ADOXACEAE

Adoxa Moschatellina L., Sp. Pl. 367 (1753); Hult., Fl. Al. and Yukon **9** : 1450 (1949).

Nisutlin River, in rich poplar woods on river terrace near Mile 36, No. 10856; Rose-Lapie Pass, on moist, shaded ledges of shaly cliffs in ravine east of Mile 105, elevation 5,000 feet, No. 10928; lower Lapie Crossing, in rich poplar woods near Mile 132, No. 9592; south slope of Mount Sheldon, in leaf-mould in *Alnus crispa* thicket near Mile 222, No. 11776. In Yukon previously collected twice in the Dawson District: Bonanza Creek, John Macoun (Can, No. 91466), and Eastwood, No. 115.

A rare and local lowland species growing in deep leaf-mould in rich poplar woods or alder thickets; in the Rose-Lapie Pass ascending to 5,000 feet where it had mature fruits on July 21. At Lapie Crossing, *Adoxa* grew in deep shade under bushes in a rich poplar wood where it was common over an area of about one acre; it flowered here on June 17.

Adoxa Moschatellina is one of the rarest plants in Canada; besides the stations listed above, it is known in Canada only from a few stations in Manitoba, Alberta, and British Columbia: Barens R., Lake Winnipeg,[1] damp mossy places between latitude 54°-64°, Richardson (Franklin Expedition) [probably from Athabasca or Clearwater River, Alta.]; Athabasca River below Cascades, E. Taylor, No. 108; Athabasca River, latitude 56 degrees, J. M. Macoun (Can, No. 9484); between lesser Slave Lake and Peace River Landing, J. M. Macoun, (Can, No. 59874); Lesser Slave Lake, Brinkman, Nos. 4148 and 4405 (US), Fort Saskatchewan, Alta., Geo. Turner; east of Nachaco River, B.C., John Macoun (Can, No. 9485), Haines Road near Yukon border, B.C., M. P. and R. T. Porsild, No. 267.

In addition it is known from a few stations in unglaciated parts of Alaska and from widely scattered stations across the United States from Idaho to New York, north to a line which approximately follows the maximum advance of the pleistocene glaciation, and south to latitude 35 degrees in Colorado.[2]

Thus, *Adoxa* is not a denizen of "Arctic America" as stated by Britton & Brown's Illustrated Flora of northeast States and Canada **3** : 283.

General distribution: circumpolar, boreal-temperate.

VALERIANACEAE

Valeriana capitata Pall. ex Link, Jahrb. **I**, 3 : 66 (1820); Ostf., Gjöa Exp. 67 (1909); Hult., Fl. Al. and Yukon **9** : 1451 (1949).

V. bracteosa Britt. in Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 183 (1901).

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[1] According to C. W. Lowe, Flowering Plants, Ferns, Club Mosses, Mosses and Liverworts of Manitoba, 1943.

[2] As testified by 24 collections across the U.S., in the Gray Herbarium.

Dawson, Moosehide, Eastwood, Nos. 315 and 488; Ranch Creek, Gorman, No. 1059; Dawson Range, Carmacks, July 12, 1933, Bostock; 62° 40′ N., 138° W., idem, No. 278; Kluane Lake, Clarke, Nos. 187, 280, and 281; Arctic Coast, Can. Arct. Exp. No. 231.

An Asiatic species, common in unglaciated central Alaska and western Yukon, that apparently extends east through the Endicott and Richardson Range to Mackenzie Delta; in central Yukon, it does not appear to have penetrated east of Yukon River where it is replaced by the Cordilleran *V. sitchensis.*

Valeriana septentrionalis Rydb. in Mem. N.Y. Bot. Gard. **1** : 375 (1900); Hult., Fl. Al. and Yukon **9** : 1454 (1949).

V. sylvatica Banks in Richards. in Frankl. 1st Journ. ed. 1, App. **7** : 730 (1823); Macoun in Ott. Nat. **13** : 213 (1899), not F. W. Schmidt.

Rose River valley, in boggy places in spruce woods near Mile 77, No. 10319; Rose-Lapie Pass, in wet open woods near Mile 102, No. 9367; same place, in wet alpine meadow near Mile 105, No. 9811; in a muskeg, No. 9253; northeast spur of Mount Sheldon, in rich subalpine meadow near Mile 226, No. 11491. Also Mayo District, 63° 36′ N., 134° 37′ W., Bostock, No. 125, and by Macoun reported from Chandindu River.

Recently recorded from the Mackenzie Mountains (Raup), also in northern British Columbia and from Great Bear Lake.

A common species in subalpine, wet meadows north to Mount Sheldon. Flowering in the Rose-Lapie Pass on June 10 and past fruiting on Mount Sheldon on August 4.

Valeriana sitchensis Bong., Veg. ins. Sitcha 145 (1832).

Pass between Teslin and Nisutlin Rivers, in alpine herbmats, elevation 5,000 feet, No. 11009; in alpine valley west of upper Rose River, Mile 95, on snowflushes by a stream, elevation 5,000 feet, No. 10223; Rose-Lapie Pass, alpine meadow at timber-line east of Mile 105, Nos. 9412 and 10929; south shoulder of Mount Sheldon, grassy slope above timber-line, No. 11635; by alpine brook on mountain west of south fork of Macmillan River, Mile 268, No. 11371; also in Macmillan Pass, N.W.T.

Common in rich, moist alpine meadows, noted or collected on all mountains along Canol Road. It flowered in the Rose-Lapie Pass on June 11, and on Mount Sheldon had flowers or young fruits on August 7. Mature fruits were noted on August 28.

The strong, almost nauseating odour emitted by this plant after the first frost was noted in alpine meadows toward the end of August.

The present series represents a notable extension of the known range of this Cordilleran Pacific Coast species.

CAMPANULACEAE

Campanula aurita Greene in Pitt. **1** : 221 (1888); Britt. & Rydb., Mem. N.Y. Bot. Gard. **2** : 183 (1901); Hult., Fl. Al. and Yukon **9** : 1456 (1949).

Dawson, Macoun, Can, 91120; ibid., Eastwood, No. 316; ibid., Malte, No. 356; Rink Rapids, Macoun, Can, No. 91121; 141st Meridian, 63° 18′, Cairnes, Can, No. 83061.

Apparently a pronounced calciphile that is endemic to upper Mackenzie Basin, central Yukon, and central Alaska. We did not see it along Canol Road until we reached the east slope of Mackenzie Mountains.

Campanula lasiocarpa Cham. in Linnaea **4** : 39 (1829); Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 183 (1901); Hult., Fl. Al. and Yukon **9** : 1457 (1949).

Pass between Teslin and Nisutlin Rivers, alpine rocky summit east of Mile 14, elevation 6,000 feet, Nos. 11010 and 11049; summit of granite mountain east of Mile 85-90 on Rose River, No. 10185; upper Rose River, on gravelly outwash plain near Mile 95, No. 10407; southeast slope of Mount Sheldon, in wet clay in shady ravine above timber-line, No. 11731; rocky ledges at summit, elevation 7,200 feet, No. 11971; upper south fork of Macmillan River, summit of schist mountain west of Mile 268, No. 11370. Noted also at Macmillan Pass. Also Rambler Hill, McQuesten Lake, Cockfield, Can, No. 97709; mountains north of McQuesten River, Christie, No. 94; Mayo, Bostock, Nos. 130 and 228; Dawson Range 62° 35′ N., 318° 20′ W., Bostock, No. 279; Klondike Indian Divide, Macoun, Can, No. 93343; north fork of Klondike, Cockfield, No. 63; Dawson, Macoun, Can, No. 91118, and 141st Meridian, 63° 55′ N., Cairnes, Can, No. 93343.

Campanula lasiocarpa apparently is a pronounced oxylophyte and was seen only on high mountains of acid rocks; on Mount Sheldon reaching 7,200 feet and usually growing in lichen heath on stony, windswept summits where the leaves and stem of the dwarf plant may be concealed among lichens with only the large flower emerged.

The species is very variable; normally it is 1-flowered and low, but occasionally, in vigorous specimens, the stem may be branched, with 1 to 4 lateral flowers, the lowermost on 4 cm.-long, leafy-bracted peduncles (No. 11731). The flowers are very large, from 2 to 3·5 cm. long, dark blue; the calyx is covered with long, white, spreading hairs; the lobes vary greatly in length and degree of lacination.

Campanula lasiocarpa flowers from about July 1; it fruits poorly, and in 1944 nearly all capsules examined were heavily infested by 4 mm. long, nematode-like worms.

Campanula rotundifolia L. Sp. Pl. 163 (1753).

C. rotundifolia L. var. *alaskana* Macoun in Ott. Nat. **13** : 214 (1899).

Johnson Crossing, where it apparently was a recent introduction, M. P. Porsild, No. 615; Chandindu River in Dawson District, J. B. Tyrrell (reported as var. *alaskana* by Macoun).

The northwestern distribution of *C. rotundifolia* is peculiar. Although common in northern British Columbia, Alberta, and the upper Mackenzie Basin, it apparently is absent in northwestern Mackenzie and rare in Yukon and Alaska. On the Pacific coast of northern British Columbia and Alaska is found the closely related var. *alaskana* (*C. latisepala* Hult., Fl. Al. and Yukon **9** : 1460 (1949)) which is distinguished by its broad and petioled stem-leaves and broader sepals.

Campanula uniflora L. Sp. Pl. 163 (1753); Macoun in Ott. Nat. **13** : 214 (1899); Hult., Fl. Al. and Yukon **9** : 1463 (1949).

Dawson District, Fortymile River, J. B. Tyrrell (according to Macoun).

A species of peculiar and disrupted range which is common from Greenland west to Keewatin and the Arctic Archipelago but very rare in the Canadian West where only a few widely separated high-alpine stations are known in the Cordillera between the Arctic Coast and Banff National Park.

Macoun's single report from Yukon has not been verified, but the species has been collected in western Alaska repeatedly.

LOBELIACEAE

Lobelia Kalmii L., Sp. Pl. 930 (1753).

The species has not actually been collected in Yukon but is found at Liard Hot Springs near the Yukon boundary and on the upper Mackenzie.

COMPOSITAE

Solidago decumbens Greene var. **oreophila** (Rydb.) Fern. in Rhod. **38** : 202 (1936).

S. oreophila Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 184 (1901).

Whitehorse, dry, sandy river terraces and open pine forest east of Lewes River, No. 10706; Johnson Crossing, M. P. Porsild, Nos. 411 and 640; in natural prairies on alluvial flats west of Nisutlin River, Mile 36, No. 10857; lower Lapie River crossing, dry shaly slopes of mountain west of Mile 132, No. 9872. In addition, the following Yukon specimens are in the National Herbarium of Canada: Mayo District, Anderson, No. 9798; Stewart River, 20 miles above Fraser Falls, Bostock, No. 131; Kluane Lake, Anderson, No. 9514; Dawson District, John Macoun, Can, Nos. 78985 and 78987, and Malte, No. 367.

A common lowland or foothill species which in southeast Yukon extends north through Pelly Range to Pelly River where it is common on calcareous, dry slopes and in dry prairies.

Flowering specimens were collected on Lapie River on June 14. The involucral bracts are somewhat glutinous and in pressing, stains the paper.

All *S. decumbens* from Yukon-Alaska, seen by the writer, belongs in the var. *oreophila.*

Solidago lepida DC. var. **elongata** (Nutt.) Fern. in Rhod. **17** : 9 (1915).

S. elongata Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 184 (1901).

According to Britton and Rydberg collected along the Yukon 50 miles above Stewart River (Tarleton). In the National Herbarium of Canada are collections from Liard Hot Springs near the Yukon boundary, Clarke, No. 94, and Anderson and Brown, No. 10378.

Solidago multiradiata Ait. in Hort. Kew. **3** : 218 (1789); Macoun in Ott. Nat. **13** : 213 (1899); Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 184 (1901).

Alpine valley west of Rose River, Mile 95, in herbmats, elevation 5,600 feet, No. 10581; Rose-Lapie Pass, alpine slopes east of Mile 105, No. 9327; same place, dry river-bank, No. 9328; dry alpine slope above timber-line west of Mile 116, No. 10082; lower Lapie River crossing, dry ridges and slopes on mountain west of Mile 132, elevation 5,600 feet, Nos. 9746 and 9747. Also Alaska-Yukon Boundary in latitude 63° 30′, 65° 18′, and 66° 20′, Cairnes, north fork of Klondike, Cockfield, No. 95; Mayo District, Bostock, Nos. 132 and 133; Haines Road, Clarke, No. 350.

In Yukon, *S. multiradiata* is a common alpine species which, along the Canol Road, was collected or noted on dry slopes north to Macmillan Pass, on Mount Sheldon ascending to 6,100 feet. On Lapie River flowering on June 20.

Solidago multiradiata Ait. var. **scopulorum** Gray in Proc. Am. Acad. **17** : 187 (1882); Macoun in Ott. Nat. **13** : 213 (1899).

Whitehorse, dry foothill slopes east of Lewes River, Nos. 9224 and 10707; Johnson Crossing, M. P. Porsild, Nos. 412 and 440; dry prairies and river-banks west of Nisutlin River, Mile 36, No. 10858; upper Rose River, gravelly river meadows near Mile 95, No. 10418; Rose-Lapie Pass, open forested southwest slopes of mountain west of Mile 116, No. 10081; lower Lapie River crossing, dry, sunny river-banks, Mile 132, No. 9686; south shoulder of Mount Sheldon, timber-line meadows in scrub fir forest, elevation 4,500 feet, No. 11690; valley of the south fork of Macmillan River, in a river meadow near Mile 250, Nos. 11437 and 11438; alpine meadows near timber-line on mountain west of Macmillan River, Mile 268, No. 11372. Also from Dawson District, Macoun, Nos. 78980, 78982, 78983, and 78984; ibid., Eastwood, No. 510A; Dawson Range, Bostock, No. 280; Kluane Lake, M. P. and R. T. Porsild, No. 149.

In Yukon the var. *scopulorum* appears to be more common than the species, growing chiefly in river meadows and on subalpine slopes below and near timber-line. The shape of the leaves varies greatly; often those of sterile rosettes are more serrate and acuminate than the basal stem leaves. No intermediate forms were noted connecting the var. *scopulorum* to the species. The specimens from Mount Sheldon and Macmillan River are taller and more leafy than those from the southern half of the road.

Flowering specimens were collected on Lapie River on June 20.

Haplopappus MacLeani Brandegee in Bot. Gaz. **27** : 448 (1899); Hall in Carn. Inst. Wash. Publ. **389** : 176 (1928), fig. 57.

Stenotus borealis Rydb. in Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 184 (1901).

S. macleani Heller in Muhlenbergia **1** : 7 (1900).

(Plate XXVII, figures 11 and 12)

Lower Lapie Crossing, dry gravelly slopes near Mile 132, No. 9283; dry, shaly lower slopes of mountain west of Mile 132, No. 9496; same place, mossy slope, No. 9556. Also from lower Pelly River, Bostock, No. 193; Ranch Creek [near Fort Selkirk], Gorman, No. 1002.

Diffuse with freely rooting branches densely covered with linear, flat, 1·0 to 1·5 cm. long, strongly keeled, acuminate, hispid-ciliate leaves; peduncles 3 to 6 cm. long, naked or bearing a single reduced leaf, glutinous from short, gland-tipped hairs; heads about 10 mm. high; bracts in 2 series, linear, 7 to 8 mm. long, acuminate, glandular-glutinous; ray flowers about 7, ligules entire, linear-lanceolate, golden yellow, achenes hispid; pappus, tawny.

Haplopappus MacLeani perhaps is most closely related to the Cordilleran *H. stenophyllus* Gray but apparently is endemic to central upper Yukon Basin where it often is a dominant species on calcareous, dry, stony and shaly slopes, usually associated with *Carex filifolia, Calamagrostis purpurascens, Saxifraga tricuspidata, Potentilla Ledebouriana, Artemisia frigida,* and others.

On Lapie River, *Haplopappus MacLeani* flowered from June 10-20; it is a handsome and ornamental species that forms cushions up to one metre in diameter. It does not thrive in a closed vegetation.

Aster alpinus L. ssp. **Vierhapperi** Onno in Bibl. Bot. **26** : [Heft 106]: tab. 6, fig. 4, (1932); Porsild in Sargentia **4** : 67-8 (1943).

A. alpinus Am. auth. not L.

A. culminis Nels. (Plate VIIIA)

Rose-Lapie Pass, dry southwest slope of mountain west of Mile 116, Nos. 10084 and 10085; lower Lapie Crossing, dry shaly slopes of mountain west of Mile 132, No. 9491; gravelly river-flats, No. 9993; stony ledges near summit of mountain south of Mile 132, elevation 5,600 feet, No. 9949; lower Ross River, dry, grassy clay terraces, No. 9703. Also from south end of Kluane Lake, Clarke, No. 192, and Anderson, Nos. 9363 and 9472.

This Cordilleran species, which was previously known in Yukon only from a single collection from upper Yukon River: Steamboat Slough, Gorman, No. 1088, is common on dry, grassy shale or clay slopes of the Pelly and lower Ross Valley where it ascends to 5,600 feet.

Aster alpinus ssp. *Vierhapperi* occupies three widely disjunct areas: Alaska-Yukon, Great Bear Lake, and Rocky Mountains from Alberta to Colorado.

The writer (l.c., p. 67) stated that "the rays [are] pure white, not golden-yellow or rose." This is most often the case, except on calcareous soil where pink or lavender ray flowers are occasionally seen. Fully expanded heads were noted in Pelly Valley on June 13, and mature achenes a month later.

Aster elegantulus Porsild in Can. Field-Nat. **64** : 43 (1950).
(Plate XXVIII, figures 1 and 2)

Perennial with a very short rhizome. Stems leafy, 30 to 40 cm. high, one or several together, slender, simple, downy soft pubescent throughout. Stem leaves entire, linear, 2·5 to 3·0 cm. long, 1·5 to 2·0 mm. wide, sessile, not clasping nor auriculate, evenly soft appressed pubescent above, glabrous beneath, revolute. Inflorescence racemose-paniculate, the branches 3 to 6 cm. long, very slender, bearing one larger, terminal head and 1 to 3 reduced lateral ones. Heads small, 10 to 15 mm. broad and 10 mm. high. Phyllaries in two series of equal length, glabrous or faintly scabrous on the margins, lanceolate, acute; the outer ones green, the inner green toward the tip and white near the base, 1-nerved, 6 mm. long, 1 mm. wide. Ray flowers about 16, their ligules spatulate, 8 mm. long and 1·0 to 1·5 mm. wide, white or pale lilac, faintly 3-nerved, somewhat curled, the tips obtuse, with 3 minute teeth. Disk flowers about 20, 5 mm. long, lilac; pappus finely barbellate, white, 3 mm. long. Achenes 1 mm. long, setose.

Whitehorse, in open aspen woods on clay banks east of Lewes River, with flowering and fruiting heads on July 28 to 29, No. 10703 (Type); Sheep Creek, Alaska-Yukon boundary, July 21, 1936, E. & J. Lohbrunner. Thus far known only from the above-mentioned stations.

Aster elegantulus, with its slender, narrow-leaved stems and few-flowered, graceful and delicate inflorescence, superficially resembles *A. junciformis* Rydb. but differs from that species, as well as from the eastern *A. junceus*, by its densely caespitose growth form, by its evenly pubescent stem, and by its phyllaries which are of equal length and arranged in two series. In *A. junciformis* and *A. junceus*, the rhizome is very slender and creeping, the stems are conspicuously striped with appressed hairs, and the phyllaries are of unequal length arranged in three series.

Aster junciformis Rydb. in Bull. Torr. Bot. Cl. **37** : 142 (1910).

Southwest Yukon, Alaska Highway, junction with Haines Road, Clarke, No. 352; White River, Gorman, No. 1129 (distributed as *Erigeron* sp.).

Aster junciformis is new to the flora of Yukon but has recently been collected in Alaska: Fairbanks, Anderson, No. 7331, and Northway Airbase, idem, No. 9068. In 1928, the writer collected a series of plants on Great Bear Lake and on lower Mackenzie River (A. E. and R. T. Porsild, Nos. 3341, 3405, 3519, 3554, and 3593) which he tentatively named *A. junceus.* A comparison with paratypical material (Can, Nos. 77050 to 77053) collected by Macoun and Herriot in Saskatchewan and Alberta, shows that the Northwest Territories plant, too, is good *A. junciformis.* Rydberg, in Flora of Rocky Mountains, p. 887, gives the range of *A. junciformis* as Sask.-Wisc.-Colo.-Wash.-B.C.

Aster Lindleyanus T. & G. in Fl. N. Am. **2** : 122 (1841).

Like the following, collected at Liard Hot Springs, B.C., Anderson and Brown, No. 10377, and therefore likely to occur also in Yukon.

Aster modestus Lindl. ex DC. Prod. **5** : 231 (1836).

This species, as yet, is not known to occur in Yukon but was collected at Liard Hot Springs, B.C., near the southeast boundary, Anderson and Brown, No. 10376.

Aster pygmaeus Lindl. in Hook., Fl. Bor.-Am. **2** : 6 (1834); Onno in Bibl. Bot. Heft **106** : 19, tab. 6, fig. 3. (1932).

A. sibiricus Macoun & Holm, Can. Arct. Exp. **5** : 20 (1921), in part, not L.

Erigeron uniflorus Macoun & Holm, ibid., in part, not L.

The identity of this arctic dwarf *Aster* has long remained obscure. Lindley himself apparently doubted its validity, for he added: "A. salsuginoso affinis," to which Hooker added: "and perhaps only a dwarf, or hairy variety of it." Onno, l.c., has revived and redescribed it, based upon Richardson's collections in Kew and New York. Besides the specimen seen by him, there are two duplicates in Gray Herbarium, both originally in Bentham's Herbarium: (1) Arctic Seacoast – Richardson and (2) Bear Lake and mouth of Coppermine River – Dr. Richardson.

The writer has compared the Gray Herbarium specimens with three sheets in the National Herbarium of Canada from the Coronation Gulf region of arctic Northwest Territories and finds that they too are unquestionably *A. pygmaeus.* These specimens are: (1) Victoria Island, latitude 69°-70° N., longitude 115° W., August 1915, D. Jenness, Can. Arct. Exp. No. 349a (Can, No. 98947, and distributed as *A. sibiricus* L.), (2 and 3) Bernard Harbour, latitude 68° 47′ N., longitude 114° 46′ W., August 1, 1915, Fr. Johansen, Can. Arct. Exp. Nos. 272a and 349 (Can, Nos. 98944 and 98943, and both distributed as *Erigeron uniflorus* L.)

The three sheets in Ottawa by Ostenfeld were annotated "*A. euarcticus* Ostf. n.sp." and No. 98947 is marked "Type." Ostenfeld's annotation is not dated but in all probability was made in 1929 when he studied the arctic collections in the National

Herbarium of Canada. Onno, in 1931, in preparation for his monograph, l.c., borrowed the National Herbarium material of the *A. alpinus* group but did not see the above-mentioned three sheets collected by the Canadian Arctic Expedition.

The following description is drawn from the more ample and better preserved material before me:

Aster pygmaeus: A low perennial, 4 to 11 cm. high, with a creeping rhizome, producing leaf- and flower-bearing shoots; stems ascending, purple, somewhat woolly, especially in the upper part and densely so below the involucrum; radical and stem leaves sessile, oblong, obtuse, entire, glabrous or woolly along the margins, about 25 mm. long and 4 mm. wide, somewhat fleshy, obscurely 3-veined but lacking the strong net-venation of *A. sibiricus*; flowering heads single, involucrum densely white-woolly, bracts linear-oblong, acute or less commonly obtuse, dark purple; ray flowers about 25, lilac, their ligules spatulate, 8 to 9 mm. long, 3- to 5-veined, their tips strongly curled; disc flowers numerous, the tube yellow with purple lobes; pappus, reddish brown; achenes, hirsute.

Thus far known only from the Coronation Gulf-Bear Lake Area, but probably occurring westward along the Arctic Coast and in the Arctic Islands.

Aster sibiricus L., Sp. Pl. II: 872 (1753); Macoun, Ott. Nat. **13** : 213 (1899).

A. montanus Richardson in Frankl. 1st. Journ. ed. 2, App. p. 32 (1823), not Nutt.

A. montanus var. *arcticus* T. & G.

A. Richardsonii Spreng. Syst. Veget. **3** : 258 (1826) based on *A. montanus* Richards. Raup, Contr. Arnold Arb. **6** : 202-4 (1934).

A. Espenbergensis Nees v. Esenbeck. Gen. et spec. Aster, p. 36 (1832).

A. giganteus Rydb. in Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 184 (1901).

A. arcticus Eastw. in Coult. Bot. Gaz. **33** : 295 (1902).

A. meritus A. Nels. ibid., **37** : 268 (1904).

A. subintegerrimus (Trautv.) Ostenf. & Resvoll in Nyt Mag. f. Naturvidensk. **54** : 163 (1916) based upon *A. sibiricus* var. *subintegerrimus* Trautv. in Middendorff Sib. Reise **1** : 161 (1847).

Whitehorse, banks of Lewes River, No. 9225; Johnson Crossing, M. P. Porsild, Nos. 312, 413, 604, 717, and 725; alluvial west bank of Nisutlin River, Mile 36, No. 10859; upper Rose River, gravelly river-flats near Mile 95, No. 10419; Rose-Lapie Pass, in subalpine meadow near Mile 105, No. 9816; dry, grassy south slope of mountain west of Mile 116, No. 10083; lower Lapie Crossing, gravelly river-flat, Mile 132, No. 9992; northeast shoulder of Mount Sheldon, elevation 5,000 feet, No. 11101; south fork of Macmillan River, grassy river-banks near Mile 250, No. 11440; also in Macmillan Pass.

A common species throughout Yukon, where it varies endlessly according to habitat; most common on gravelly river-flats but also in dry meadows and prairies, on dry, grassy slopes and even in open forest.

Raup, l.c., has shown that *A. montanus* Richards., *A. Richardsonii* v. *giganteus* Lindl., and *A. meritus* Nels. are all forms of the polymorphic *A. Richardsonii* and accordingly concludes that the tall plant of the southern Cordillera with its large, crowded inflorescence should be maintained as *A. Richardsonii* var. *meritus* (Nels.) Raup. In Sargentia **6** : 239-40 (1947) he admits that *A. Richardsonii* cannot be maintained as distinct from *A. sibiricus*, and the new combination *A. sibiricus* var. *meritus* (Nels.) Raup is made. In this connection it is worthy of note that in his treatment of *Aster* for Hooker's Fl. Bor.-Am., Lindley did not recognize *A. sibiricus* in the Hooker material from North America. The low glabrate, mostly monocephalic plant from "Barren country from lat. 64° to the Arctic Sea. Dr. Richardson [and] Kotzebue Sound, Chamisso (in Herb. Nostr.)" he considered *A. Richardsonii,* and the taller, more hirsute and usually many-headed: *β gigantea,* from "About Fort Franklin, on the Mackenzie River".

Comparison with Eurasian *A. sibiricus* shows that the American plant exhibits the same range of variation. On high mountains of the Canadian Rockies is found a dwarf, entire-leaved and glabrous form which is indistinguishable from *A. subintegerrimus* (Trautv.) Ostf. & Resvoll of Arctic Europe. (Top of Rocky Mountains, Dawson, Can, No. 26382; Kicking Horse Lake, B.C., August 10, 1890, John Macoun; Sheep Mountain, Waterton Lake, Macoun, Can, No. 10266; Crowsnest Pass, Macoun, Can, No. 23061).

There is, however, still another plant, the identity of which has long been obscure. This is *A. pygmaeus* Lindl. in Hook., Fl. Bor.-Am. **2** : 6 (1834), which appears to be a well marked species, so far endemic to the Coronation Gulf region of arctic Northwest Territories. *See* this.

Erigeron angulosus Gaud. var. **kamtschaticus** (DC.) Hara in Rhod. **41** : 389 (1939) for complete synonymy.

E. acris L. var. *asteroides* (Andrz.) DC.; Cronquist in Brittonia **6** : 294 (1947).

E. elongatus Ledeb. *See* Fern. in Rhod. **40** : 346-7 (1938).

Whitehorse, Anderson, No. 9594: Johnson Crossing, M. P. Porsild, No. 321; alluvial flats west of Nisutlin River, in boggy places in flood-plain spruce forest near Mile 36, No. 10863; same place, in flood-plain meadow, No. 10860; in subalpine meadows in saddle between Mount Riddell and Mount Sheldon, elevation 4,300 feet, No. 11687. Also Red Mountain, Gorman, No. 1101; Dawson District, Malte, No. 132; ibid., Macoun, Can, 78991, and Mayo, Anderson, No. 9700.

Rare to occasional in flood-plain meadows and in boggy places in spruce and fir forest. Specimens with flowers and immature fruits collected on Nisutlin River on July 23-26.

Erigeron caespitosus Nutt. in Trans. Am. Phil. Soc. N. Ser. **7** : 307 (1841); Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901).

Pelly River, Dawson, Can, No. 11074; between Whitehorse and Dawson, E. & J. Lohbrunner, No. 121; Fort Selkirk, Gorman, No. 1112; 63° 25′ N., 141° W., Cairnes, Can, No. 93349; and at Kluane Lake, Anderson, No. 9471 (distributed as *E. purpuratus*); same place, M. P. and R. T. Porsild, Nos. 146 and 148B.

Although conditions were suitable in Pelly Range, this species was not noted there by us.

Erigeron compositus Pursh var. **trifidus** (Hook.) Gray in Proc. Am. Acad. **16** : 90 (1880).

E. Gormani Greene in Pitt. **4** : 156 (1900).

E. multifidus Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901).

Carcross, Eastwood, No. 401; Whitehorse, dry slopes east of Lewes River, Nos. 9226 and 9227; same place, Miles Canyon, M. P. and R. T. Porsild, Nos. 21 and 89; foothills north of Whitehorse, No. 10708; lower Lapie Crossing, dry, shaly slopes of mountain west of Mile 132, No. 9497. Also from the upper Yukon, Fort Selkirk, Gorman, No. 1066 (type of *E. Gormani*) and Lake Kluane, Anderson, No. 9512.

The material, all except M. P. and R. T. Porsild, No. 89, which approaches the typical plant, belongs to the poorly defined var. *trifidus*. Plants with discoid heads were collected at Whitehorse (No. 9226).

Occasional or locally common on calcareous shales of Pelly Range where flowering specimens were noted on the first days of June.

Erigeron elatus Greene in Pitt. **3** : 164 (1897). *See* Fernald in Rhod. **40** : 347 (1938).

E. acris L. var. *arcuans* Fern. in Rhod. **28** : 236 (1926).

E. acris L. var. *elatus* Cronquist in Brittonia **6** : 296 (1947).

Johnson Crossing, M. P. Porsild, Nos. 522 and 590; alluvial flats west of Nisutlin River, margin of slough near Mile 38, No. 10861; same place, boggy places in flood-plain spruce forest, No. 10862; Rose River valley, pine and spruce bogs near Mile 77, No. 10322; upper Rose River, by a creek on mountain east of Mile 85-90, No. 10186; upper Rose River, flood-plain meadows and gravel bars near Mile 95, Nos. 10420 and 10422; Rose-Lapie Pass, subalpine meadows near headwaters of Lapie River, Mile 102, No. 10635; lower Lapie River, gravelly river-flat near Mile 127, No. 10024; in saddle between Mount Riddell and Mount Sheldon, in burnt-over spruce forest, No. 11686.

A common species in flood-plain meadows, open places in boggy spruce forest, etc. It flowers earlier than *E. angulosus* var. *kamtschaticus* with which it was sometimes associated. In Rose-Lapie Pass our specimens had almost mature fruits on July 3.

Erigeron eriocephalus J. Vahl in Fl. Dan. **13** : tab. 2299 (1840).

E. uniflorus ssp. *eriocephalus* Cronquist in Brittonia **6** : 236 (1947).

Upper Rose River, alpine slopes west of Mile 95, No. 11996; Mount Sheldon, rocky ledges below summit, elevation 7,200 feet, No. 11754. In Yukon previously collected along the Alaska-Yukon boundary, Cairnes, No. 66.

The specimens are not typical but, because of their large and densely woolly involucres and upper stems, are placed here rather than with *E. unalaschkensis*.

Two other numbers are tentatively placed here but may prove distinct. They closely approach *E. borealis* (Vierh.) Simm. of Greenland (*E. alpiniformis* Cronq.): Perennial with weakly developed base, radical leaves spathulate-oblanceolate; stems single or rarely two together, 1 to 12 cm. high with 3 to 6 linear-oblong leaves, long pubescent throughout; heads small, 10 to 15 mm. in diameter; involucre cinereous with a bluish tinge, densely woolly, bracts with attenuate somewhat reflexed tips:

Rose-Lapie Pass, southwest slope of high mountain west of Mile 116, No. 10086; alpine summit east of Mile 105, elevation 5,600 feet, No. 10937.

Erigeron glabellus Nutt. ssp. **pubescens** (Hook.) Cronq. in Brittonia **6** : 158 (1947).

E. Turneri Greene fide Cronq., l.c.

This subspecies was reported from Five-finger Rapids on the Yukon (Britt. & Rydb., l.c.). Although the writer has not seen the specimens which are not cited by Cronquist, l.c., the report undoubtedly refers to this subspecies, which is known to occur in the upper Mackenzie Basin and in central Alaska.

Erigeron jucundus Greene in Pitt. **3** : 165 (1897).
E. acris L. var. *debilis* Gray.

Upper Rose River, gravelly outwash fan near Mile 95, No. 10444; Rose-Lapie Pass, in rocky chimney on mountain west of Mile 118, elevation 5,500 feet, No. 10145.

Flowering specimens collected on June 29. A rare or occasional Cordilleran species which was noted only in the Pelly Range.

Tall, fruiting specimens may superficially resemble *E. elatus* but can usually be distinguished by their spatulate-obovate, obtuse and long-petiolate radical leaves and by the pappus which is pure white. The radical leaves of *E. elatus* are usually lanceolate with acute tips, but exceptional forms occur in which the radical leaves are indistinguishable from those of *E. jucundus* (*E. elatus* Nos. 10422 and 10186). These, however, are much taller and have more numerous heads than *E. jucundus*. Specimens from the northern part of the range of *E. jucundus* average higher and more robust than those from the Rocky Mountains.

Erigeron lonchophyllus Hook. in Fl. Bor.-Am. **2** : 18 (1834); Cronquist in Brittonia **6** : 291 (1947).

Johnson Crossing, in woods and by roadsides, M. P. Porsild, Nos. 443 and 492; lower Lapie River crossing, Mile 132, in peaty soil in a muskeg along a bulldozer trail, where it may be a recent introduction, No. 9844. Also south end of Kluane Lake, along the Alaska Highway, Anderson, No. 9358.

Erigeron philadelphicus L.; Sp. Pl. 863 (1753).

Liard Hot Springs, B.C., near the Yukon boundary, Clarke, Nos. 91, 92, and 93. Thus far not recorded from Yukon proper but may be expected in suitable places.

Erigeron purpuratus Greene in Pitt. **4** : 156 (1900); Cronquist in Brittonia **6** : 239 (1947).

According to Cronquist, l.c., collected twice in Yukon: Fort Selkirk on the upper Yukon, June 28, 1899, Gorman (Type), and at Lake Kluane to Donjek River, August 11-27, 1920, A. Müller.

Otherwise endemic to central Alaska.

Erigeron unalaschkensis (DC.) Vierh. in Beih. Bot. Centralbl. **19** : 492 (1906).

E. humilis Cronq. in Brittonia **6** : 237 (1947).

Upper Rose River, alpine valley west of Mile 95, on snowflushes, No. 10224; on gravel bars in Rose River, Mile 35, No. 10421; Rose-Lapie Pass, by a mountain stream near Mile 105, No. 9817; alpine slopes above timber-line west of Mile 116, No. 10087; same place, snowflushes west of Mile 118, No. 10144; lower Lapie River crossing, rocky summit south of Mile 132, No. 9951; saddle between Mount Riddell and Mount Sheldon, in subalpine meadow, No. 11685; upper south fork of Macmillan River, Mile 280, No. 11311. Also Mayo, Bostock, No. 229; Kluane Lake, 6,000 to 7,000 feet elevation, Clarke, No. 285; Lake Dezadeash, Clarke, No. 428.

The specimens in the present series may represent two ecotypes: an alpine and a lowland form, which superficially appear quite distinct but which seem to be connected by intermediate forms. The first is 5 to 10 cm. high, with a rather short, rhizomatose base, and very small heads with bluish black involucres (Nos. 9817, 10087, and 10224); the lowland plant is up to 30 cm. tall, with a leafy stem, which is long-villous above, and has larger heads with paler and more villous involucres.

Erigeron yukonensis Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901); Cronquist in Brittonia **6** : 227 (1947).

E. grandiflorus Ostf. in Gjöa Exp. 67 (1909); Macoun & Holm., Rept., Can. Arct. Exp. **5A** : 21 (1921); Porsild in Sargentia **4** : 68 (1943), not Hook.

Whitehorse, Macoun, Can, No. 78996; Dawson, Eastwood, No. 454; lower Klondike, Cockfield, No. 64; Herschel Island, Gjöa Exp.; same place, Stringer, Can, No. 101333 and Can. Arct. Exp. No. 557. Otherwise known only from the Mackenzie Delta and the Arctic Coast east to Cape Dalhousie (Porsild, Nos. 1970, 2019, 2804, 2940, and 2950, all distributed as *E. grandiflorus*).

The writer, l.c., following Ostenfeld, l.c., misidentified specimens from the Arctic Coast east and west of the Mackenzie Delta as *E. grandiflorus*. A re-examination and comparison with typical material of that species shows that the arctic plant is *E. yukonensis*, the type of which came from Dawson, R. S. Williams, July 23, 1899.

Erigeron yukonensis is certainly much closer to *E. simplex* of the Rocky Mountains than to *E. Eatonii* and *E. macranthus* with which Rydberg also compared it.

ANTENNARIA

The genus *Antennaria*[1] is well represented in central Alaska and Yukon. Thus far the richest collections have been made in southeastern Yukon where, in mountain areas adjacent to the Canol Road, we recognized no less than 22 species, of which 9 were undescribed.

KEY TO THE GENUS ANTENNARIA IN YUKON AND ADJACENT PARTS OF ALASKA AND NORTHWEST TERRITORIES

A. Basal leaves prominently 3-nerved, erect, 4-16 cm. long, similar to cauline leaves. (CARPATICAE) *A. pulcherrima*
Nfld. to Alaska

A. Basal leaves 1-nerved or at most with obscure and weak lateral nerves, 3 to 5 cm. long, but mostly less; cauline leaves reduced, usually ending in a scarious appendix.

  B. Tall, broad-leaved plants; stolons of the year flagellate, ending in leafy rosettes; heads large, with involucres about 10 mm. high. (PLANTAGINIFOLIAE)

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[1] A monographic treatment by the present writer of the species of *Antennaria* known to occur in northwestern Canada and in adjacent parts of Alaska has been published in the Canadian Field-Naturalist **64** : 1–25 (1950)

Key to the Genus Antennaria in Yukon, etc.—*Continued*

C. Basal leaves obovate-cuneate, distinctly petiolate, rarely over 3 cm. long; flowering stems 10 to 25 cm. tall, weak. Plant dioecious.

A. campestris
foothills and prairies north to Slave Lake

C. Basal leaves oblanceolate, gradually tapering toward the base, 3 to 5 cm. long; flowering stems 25 to 35 cm. high, stout. Staminate plant unknown.

A. Howellii
open alpine forests; Oregon-Montana and Sask., north to S.E. Yukon

B. Tall, medium or dwarf species; stolons of the year not flagellate, leafy throughout; heads smaller, with involucres less than 8 mm. high (or, if over, small-leaved, dwarf species less than 15 cm. tall: *A. angustata* and *A. megacephala*).

D. Bracts of the involucres (phyllaries) with pale greenish brown to olivaceous or dark brown, usually acuminate and erose tips. (ALPINAE)

E. Male and female plants usually present.

F. Involucres of pistillate heads small, 4 to 5 mm. high.

G. Strictly monocephalous, densely tufted, lacking stolons, flowering stems rather low and stout.

A. monocephala
E. Asia, east to N.W. Mackenzie, ? Alberta, and B.C.

G. Heads normally 3 to 5, basal leaves oblanceolate, with well-developed, purple-tinged petioles, appressed tomentose on both surfaces.

A. alaskana
Alaska

F. Involucres of pistillate heads larger, about 6 mm. high.

H. Plant strictly monocephalous, almost entirely glabrous; with long stolons.

A. philonipha
Alaska, Yukon, and N.W. Mackenzie

H. Plant normally pleiocephalous, densely caespitose with stout rhizomatose caudex.

I. Basal leaves spatulate, 10 to 15 mm. long, not imbricated, thinly appressed tomentose on both sides; achenes papillose.

A. neoalaskana
N. W. Mackenzie, ? Alaska

I. Basal leaves densely imbricated, about 6 mm. long; achenes glabrous.

A. densifolia
Mackenzie Mts.

E. Only female plant known.

J. Plant normally monocephalous, densely tufted, lacking stolons.

K. Inner phyllaries normally with blunt, pale straw-coloured tips.

A. pygmaea
Lab., Keewatin, Mack., and Yukon

K. Inner phyllaries with attenuate olive-brown tips.

A. angustata
Lab., Keewatin, disjunct stations in Mack., and Alaska

KEY TO THE GENUS ANTENNARIA IN YUKON, ETC.—*Continued*

J. Plant normally pleiocephalous (dwarf plants of *A. megacephala* often monocephalous).

L. Plant caespitose with stout rhizomatose caudices and numerous sessile, sterile rosettes.

M. Basal leaves very narrowly oblanceolate, gradually tapering toward the apex; pappus somewhat rufidulous; achenes glabrous or minutely papillose.
E. Ekmaniana
Greenl. to Alaska,
high-arctic-alpine

M. Basal leaves spatulate-obovate, rounded at the apex; pappus white; achenes glabrous.

N. Basal leaves short obovate, white-lanate-tomentose; stems floccose; plant pulvinate.
A. compacta
N. W. Mackenzie-Alaska to
S.E. Yukon; arctic-alpine

N. Basal leaves longer, grey, thinly appressed tomentose; stems purple under the thin non-floccose tomentum; plant caespitose but not pulvinate.
A. subcanescens
N. W. Mackenzie-Alaska;
arctic-alpine

L. Loosely caespitose with basal rosettes borne on normally well-developed prostrate or ascending stolons.

O. Achenes strongly papillose, even when immature; heads 4 to 10 with involucres 6 to 7 mm. high.

P. Inflorescence rather compact; inner phyllaries dark brown.
A. stolonifera
S. E. Yukon, ? Rocky Mts.

P. Inflorescence open, the lower heads remote, on long peduncles; inner phyllaries pale brown.
A. pedunculata
S.E. Yukon-N.E. Alaska

O. Achenes glabrous.

Q. Heads large, 1 to 5, with involucres 7 to 10 mm. high.

R. Heads 1 to 3; stolons very short and plant forming small, compact tufts.
A. megacephala
N. British Columbia-
S.E. Yukon

R. Heads 1 to 5; loosely caespitose with well-developed stolons.
A. atriceps
N. British Columbia

Q. Heads smaller, 3 to 5, with involucres 6 to 7 mm. high; loosely caespitose with well-developed stolons.
A. pallida
E. Pacific Coast, west
to Aleut Isl.

D. At least the inner phyllaries with papery, white, straw-coloured or pink, and usually spatulate ligulate tips; in our area only the female plants known. (DIOICAE)

a. Inner phyllaries pink (in *A. elegans* soon becoming pale grey or straw-coloured).

b. Tall plants with fruiting stems usually 20 cm. or over.

c. Plants with well-developed stolons, forming colonies.

d. Basal leaves fresh green, glabrate above; cauline leaves ample; fruiting stems 20 to 30 cm. high; heads showy, nodding in youth.
A. alborosea
Central Alaska-Yukon,
Mack.; ? mts. of Alberta and
British Columbia

KEY TO THE GENUS ANTENNARIA IN YUKON, ETC.—*Continued*

d. Basal leaves neither fresh green nor glabrate above, cauline leaves reduced.

e. Basal leaves narrowly spatulate, appressed sericeous-tomentose; phyllaries pale pink only in youth, soon becoming pale grey or straw-coloured.

A. elegans
S.E. Yukon, Bear Lake

e. Basal leaves oblanceolate, dull greyish tomentose; phyllaries pink, even in age.

A. rosea
S.E. Yukon, south through Rocky Mts., east to James Bay

c. Plants with short, sessile offsets, forming small tufts; basal leaves spatulate-obovate, with appressed grey tomentum.

A. oxyphylla
Central Alaska-Yukon, east to Lake Athabasca, south to Nebraska and S. Dakota

b. Dwarf plants with fruiting stems less than 20 cm. high.

f. Heads nodding in youth; plants of low, matted growth; basal leaves short, spatulate-obovate, sessile, somewhat crowded, ashy grey, in age becoming glabrous above; achenes sparingly, but distinctly papillose.

A. Breitungii
Central Alaska and Yukon

f. Heads not nodding in youth; basal leaves erect, oblanceolate, sericeous-tomentose.

A. incarnata
S.E. Yukon

a. Inner phyllaries papery white or straw-coloured, never pink (in *A. leuchippi* with purple spots visible only under a lens).

g. Tall plants with fruiting stems usually 20 cm. high or over, with long, trailing stolons.

A. leuchippi
S.E. Yukon

g. Dwarf to medium plants with fruiting stems usually under 20 cm.

h. Monocephalous; densely tufted; flowering stems rarely over 10 cm; basal leaves small, rarely over 10 mm. long.

A. pygmaea
Lab., Keewatin, Mack., and Yukon

h. Inflorescence pleiocephalous, usually with from 4 to 10 heads.

i. Heads nodding when young, inflorescence glomerulate, phyllaries firm, papery, white.

j. Cauline leaves all without scarious tips; basal leaves densely canescent-tomentose.

A. Laingii
Central Alaska, S.E. Yukon

j. Upper 1 to 3 cauline leaves with slender, scarious tips; basal leaves appressed sericeous-tomentose, almost silvery.

A. nitida
Central Alaska-Yukon east to James Bay; in Rocky Mts. and foothills south to N. Mexico

KEY TO THE GENUS ANTENNARIA IN YUKON, ETC.—*Concluded*

i. Heads not nodding in youth; inflorescence open, with the lateral heads pedunculate; phyllaries rather thin and soft, their tips often spreading in age.

k. Pappus pale rufidulous; plant pulvinate with short sessile, erect offsets. *A. crymophila* Mackenzie Delta

k. Pappus white; plant not pulvinate.

l. Upper 1 to 3 cauline leaves with slender, scarious tips. *A. subviscosa* Gaspé, Que., and S.E. Yukon

l. Upper 5 to 8 cauline leaves with broad, flat, and very prominent scarious appendages. *A. isolepis* Labrador-Alaska

SECT. PLANTAGINIFOLIAE

Antennaria Howellii Greene; Porsild in Can. Field-Nat. **64** : 10 (1950), map Tab. 1, fig. 2.

Watson Lake, Anderson & Brown, No. 9938 (Can and S); Rancheria west of Whitehorse, Anderson, No. 10501 (S).

Antennaria Howellii is a Cordilleran species which apparently extends north through mountains of northern British Columbia into southeastern Yukon. It is a species of open mountain forest rather than of dry grassland and is larger and more robust than the prairie and foothill species, *A. campestris*, which, thus far, has not been collected north of Slave Lake.

SECT. CARPATICAE

Antennaria pulcherrima (Hook.) Greene; Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901); Porsild in Can. Field-Nat. **64** : 10 (1950), map Tab. 1, fig. 3.

River-banks and alluvial flats along west bank of Nisutlin River near Mile 36-42, No. 10867; Rose-Lapie River pass, Mile 105, alpine meadow near Lapie Lake, No. 9813; same place, alpine meadow by a stream, No. 9812; base of granite mountain west of Mile 116, by a creek, No. 10088; lower Lapie River, gravelly river-flats near Mile 127, No. 10025.

A common species in alluvial river-flats and meadows of the Nisutlin, Rose, and Lapie Rivers. It was never seen above the valley bottoms and not north of Mile 127.

General distribution: Central Alaska, Yukon, Mackenzie south to Colorado and Washington, east to Hudson Bay, with isolated stations in Quebec and Newfoundland.

Antennaria pulcherrima (Hook.) Greene var. **angustisquama** Porsild in Can. Field-Nat. **64** : 11 (1950), map Tab. 1, fig. 4.

(Plate XXIX, figures 4 and 5)

Differs from the species by its narrower and glabrate leaves, long-pedunculate and remote lateral heads and narrower, long-attenuate, greenish-black tipped phyllaries. The male plant of the variety is unknown.

Upper Rose River on alluvial flats, elevation 3,600 feet, July 12, 1944, No. 10413 (Type).

The var. *angustisquama* differs from the species in so many and important characters that, were it not for the fact that only one single colony of about 50 individuals could be found, the writer would be inclined to consider it distinct. No specimens connecting it to the species were seen elsewhere, nor has the writer seen such in the large material of *A. pulcherrima* in the National Herbarium of Canada, the Gray Herbarium, and the U.S. National Herbarium.

General distribution: Known only from the type locality.

SECT. ALPINAE

Antennaria compacta Malte; Porsild in Can. Field-Nat. **64** : 12 (1950), map Tab. 1, fig. 8. (Plate XXX, figures 1-8)

Pass between Teslin and Nisutlin Rivers, summit of granite mountain east of road opposite Mile 10-14, elevation 5,000 to 6,000 feet, No. 11012; Rose River valley, granite mountain east of Mile 85-90, elevation 5,000 to 6,000 feet, stony slope near summit, No. 10192; northeast shoulder of Mount Sheldon, opposite Mile 222, stony ridge near glacial cirque, elevation 5,000 feet, August 13, 1944, No. 11098; south shoulder of Mount Sheldon, stony ledge above timber-line, elevation 6,000 feet, No. 11642; same place, rocky ledge near summit, elevation 7,000 feet, No. 11756.

Rare or occasional on rocky ledges and summits of high granitic mountains of southeastern Yukon.

Antennaria compacta is perhaps most closely related to *A. densifolia* Porsild (Nat. Mus., Canada, Bull **101** (1945)), from calcareous rocks of the east slope of Mackenzie Mountain, but differs by its less compact growth form, longer offsets and less imbricated leaves, and by its strong preference for granitic or acidic rocks. Characteristic of this species is the snowy white floccose tomentum of the leaves and the flowering stems.

General distribution: Mountains of Alaska and Yukon east through arctic Northwest Territories to Coronation Gulf.

Antennaria Ekmaniana Porsild in Sargentia **4** : 69-71 (1943); idem in Can. Field-Nat. **64** : 13 (1950), map, Tab. 1, fig. 10.

Pass between Teslin and Nisutlin Rivers opposite Mile 10-14, rocky summit of granite mountain, elevation 6,000 feet, No. 11011; lower Lapie River crossing, Mile 132, stony ledge near summit of mountain south of road, elevation 5,000 feet, No. 9954; Macmillan Pass, Mackenzie-Yukon Divide, mountain slope north of river, No. 11271.

An arctic-alpine species, in Alaska and Yukon restricted to stony lichen-covered slopes of high mountains. It forms small firm tufts; the achenes are glabrous or minutely papillose.

General distribution: Northern west Greenland, Baffin Island, northern Keewatin, Mackenzie, and Arctic Archipelago west to high mountains of Yukon and Alaska.

Antennaria megacephala Fern. in Raup in Contr. Arn. Arb. **6**:208 (1934), tab. 9; Porsild in Can. Field-Nat. **64** : 13 (1950), map Tab. 1, fig. 11. (Plate XXX, figures 9 to 14)

Rose-Lapie River pass, southwest slope of granite mountain west of Mile 116, alpine slope near snowbank, elevation 5,000 feet, July 1, 1944, No. 10091; granite-schist mountain west of Mile 118, rocky chimneys and screes, elevation 4,500 feet, No. 10153.

High, alpine slopes of granitic mountain range in Rose-Lapie Pass where the species forms small, isolated tufts each bearing one or two flowering stems.

The type of *A. megacephala* that came from mountains of northern British Columbia and consisted of dwarf, monocephalous specimens led Professor Fernald to compare his plant with the strictly monocephalic *A. glabrata* and *A. angustata*. In the large colonies of *A. megacephala* found on high, alpine slopes of Pelly Range, the larger and more vigorous plants have flowering stems measuring 10 to 12 cm. in height, each bearing from 2 to 3 heads, whereas dwarf plants are all monocephalous. In all other respects the Pelly Range plant is a close match for the type: Mrs. J. Norman Henry, No. 286 (Phila. Acad., G). Characteristic for *A. megacephala* are the large heads with broad, acuminate, dark green or olivaceous phyllaries and the unusually long, scarious tips of the upper cauline leaves.

General distribution: High mountains of northern British Columbia and southeast Yukon.

Antennaria monocephala DC.; Porsild in Can. Field-Nat. **64** : 14 (1950), map Tab. 2, fig. 12.

Upper Rose River, granite mountain range west of Mile 95, No. 10585; alpine slopes of mountain opposite Mile 85-90, No. 10193; Rose-Lapie Pass, in alpine meadow under willows, No. 9255; same place, alpine slope above timber-line, Nos. 9381, 9414, and 9815; alpine slope of granite mountain west of Mile 116, No. 10089; alpine screes of granite mountain west of Mile 118, No. 10150; lower Lapie River crossing near Mile 132, rocky ledges near summit of mountains south of road, No. 9953.

A common species above timber-line of granitic mountains where the species is ubiquitous in snow-patch vegetation, in ravines, and in avalanche paths.

In one pistillate head in No. 9953, the pappus is pale pink.

General distribution: Eastern Asia, western and southern Alaska south to latitude 60 degrees, east to Mackenzie Mountains, with isolated stations on high mountains of British Columbia.

Antennaria pedunculata Porsild in Can Field-Nat. **64** : 15 (1950), map Tab. 2, fig. 15. (Plate XXXI, figures 1 to 5)

Humifuse, with freely branching stems 5 to 8 cm. long; old individuals frequently attaining a diameter of from 25 to 100 cm. The well-developed stolons, 5 to 10 cm. long, bearing oblanceolate and mucronate, 2·0 cm. long and 0·5 cm. broad leaves that in youth are thinly silky-tomentose, in age becoming glabrescent showing a single, prominent nerve on the underside. Flowering stems, 15 to 22 cm. high, glabrescent, bearing 8 to

10 linear-lanceolate leaves; the lowermost obtuse, the upper with scarious tips. The pistillate heads cymose, 1 to 5, the lateral ones rather remote on 3 to 6 cm. long peduncles. Involucres 7 to 10 mm. high, lanate at their bases. Phyllaries of unequal length, 3-seriate, the outside ones oblanceolate dusky brown, the inner ones oblanceolate, subacute or obtuse, papery, in age somewhat spreading. Corolla purple. Styles much exserted bifid. Achenes 1·0 mm. long, olivaceous, strongly papillose. Staminate plant unknown.

Upper Rose River valley, Mile 95, elevation 3,600 feet, on gravelly outwash plain, July 12, 1944, No. 10447 (type); Rose River valley, alpine slopes of mountain east of Mile 77, No. 10965; east side of Rose River valley, granite mountain opposite Mile 85-90, dry slope, elevation 5,000 feet, No. 10191.

A rather peculiar looking species inhabiting open, willow or birch thickets, rock slides, and outwash plains. It is, undoubtedly, closely related to *A. stolonifera* from which it differs by its long-pedunculate lateral heads and by the broad, rather obtuse, and pale chartaceous inner phyllaries. No intermediate forms were seen between it and *A. stolonifera.*

General distribution: Known only from the above stations.

Antennaria philonipha Porsild in Rhod. **41** : 294 (1939), Tab. 554, figs. 1-10; idem. in Can. Field-Nat. **64** : 15 (1950), map Tab. 2, fig. 16.

Pass between Teslin and Nisutlin Rivers, east of Mile 10-14, treeless, alpine meadow, elevation 4,000 feet, No. 11156; same place, alpine slopes and summit of granite mountain, 6,000 feet elevation, flowering specimens July 6, No. 11013; same place, fruiting specimens, July 30, No. 11050; Rose River valley, Mile 77, alpine slopes, No. 10964; steep west slope of granite range east of upper Rose River, Mile 95, No. 10524; Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, flowering near snowbank, June 29, elevation 5,000 feet, No. 10154; south and east slopes of Mount Sheldon, steep ravines opposite Mile 222, Nos. 11778, 11779, and 11755; same place, rocky ridges on southeast shoulder, elevation 6,000 feet, No. 11640; northeast shoulder of Mount Sheldon, in mossy, alpine tundra, 6,000 feet elevation, Nos. 11099 and 11100; Macmillan Pass, Mackenzie-Yukon Divide, alpine treeless meadows, No. 11273.

Antennaria philonipha is a common species in alpine meadows and near snow flushes on granitic mountains along the Canol Road. It flowers from early in June, but near alpine snowfields flowering specimens may be seen throughout the summer. On Mount Sheldon it was seen above the 6,000-foot elevation.

In anthesis the long exserted styles are first pale rose and later turn reddish purple. The staminate heads are quite showy when the pink corolla lobes are expanded. In No. 10154 a few staminate plants, besides the terminal head, had two small, lateral ones.

The material in the large series collected suggests that the Yukon plant is somewhat more robust than that of the type from the Mackenzie Delta. The species is no doubt closely related to *A. monocephala* and when found together, intermediate forms or hybrids may occur.

General distribution: Alaska, Yukon, and northwest Mackenzie.

Antennaria stolonifera Porsild in Can. Field-Nat. **64** : 16 (1950), map Tab. 2, fig. 17. (Plate XXXII, figures 1 to 9)

Humifuse with well-developed, subligneous, freely creeping and spreading 5 to 10 cm. long stolons; old individuals frequently attaining a diameter of one metre or more. Basal leaves spatulate, obtuse and flat, 20 to 25 mm. long and 4 to 5 mm. broad, thinly silky-tomentose on both surfaces, rarely glabrate, distinctly 1-nerved. Flowering stems about 10 cm. high at the time of florescence, soon elongating, becoming 14 to 18 cm. high toward maturity, robust and stiffly erect; the cortex purplish under the white, floccose tomentum. Stem leaves 8 to 10, the lowermost well developed, linear-lanceolate, 15 to 20 mm. long and lacking scarious tips, the upper smaller and bearing long scarious appendages. Pistillate heads 3 to 5, densely glomerate, at the time of florescence; later the lower peduncles elongate so that the lateral heads in time overtop the central ones. Phyllaries 3-seriate, the exterior ones densely lanate, with obtuse greyish tips; the interior linear-oblong, obtuse, olivaceous. Corolla, purple; styles barely exserted. Achenes small, 0·8 mm. long, with numerous long, hispid papillae. Pappus dirty white, finely barbellate. Staminate plant unknown.

Pass between Teslin and Nisutlin Rivers, opposite Mile 10-14, alpine slopes, elevation 4,500 to 6,000 feet, Nos. 11051 and 11052a; same place, treeless, alpine meadow, No. 11155; granite mountain range west of upper Rose River opposite Mile 95, alpine meadows elevation 5,600 to 6,000 feet, No. 10586; same place, alpine slopes, elevation 5,000 feet, No. 10231; same place, rocky slope, elevation 5,000 feet, No. 10232; upper Rose River, Mile 95, gravelly outwash plain, 3,600 feet, No. 10448; Rose-Lapie River pass, east slope of granite-schist mountain west of Mile 118, screes and rocky chimneys, No. 10151; south shoulder of Mount Sheldon, grassy slopes near timber-line, No. 11641; south and east slope of Mount Sheldon, opposite Mile 222, steep ravines and ledges, elevation 4,000 to 5,000 feet, No. 11780; northwest end of Itsi Range, alpine slopes above timber-line, No. 11392; upper south fork of Macmillan River, shale mountain west of river opposite Mile 268, forming dense mats near snowfield, elevation 5,500 feet, No. 11377 (type); Macmillan Pass, Mackenzie-Yukon Divide, elevation 4,600 feet, Nos. 11272 and 11274.

This large series is remarkably uniform and representative of what is undoubtedly a good and well-marked species and a good match for some specimens in the National Herbarium of Canada from the Canadian Rockies which, by Greene, tentatively were identified with his *A. media*. Our plant, however, is a much larger plant than true *A. media* of which the type, Sierra Nevada, Cal., C. F. Sonne, July 31, 1892 (NY) is before me; also, in true *A. media* the male plant is common; although hundreds of colonies of *A. stolonifera* were carefully examined, not a single male plant could be found. Our plant superficially resembles *A. atriceps* Fern. of mountains of northern British Columbia. That species, however, has glabrous achenes and long-acuminate olivaceous phyllaries; in our plant, the phyllaries are obtuse and the achenes very hispid.

The type, No. 11377, from a mountain on upper Macmillan River was collected late in the season near a perennial snowfield. The long series include specimens at all stages of development and beautifully illustrates the range of seasonal variation.

Antennaria stolonifera is a common species on alpine slopes of southeast Yukon where it forms colonies often more than one metre in diameter.

General distribution: Mountains of southeast Yukon and ? Alberta.

Antennaria subcanescens Ostf. in Malte; Porsild in Can. Field-Nat. **64** : 17 (1950), map Tab. 2, fig. 18.

Pass between Teslin and Nisutlin Rivers, rocky, alpine summit of granite mountains, elevation 5,200 feet, No. 11052.

Antennaria subcanescens, like *A. compacta*, has a short thick rhizome and short offsets but differs from that species by its thin and distinctly grey indument of the basal leaves, sparse and thin indument of the flowering stems that, especially in their upper part, are viscid from long, gland-tipped papillae. The pappus is short, somewhat sordid, and the achenes glabrous. It is an arctic-alpine species, so far known only from a few stations.

General distribution: Mountains of central Alaska and Yukon, and the Arctic Coast east of Coronation Gulf.

SECT. DIOICAE

Antennaria alborosea A. E. Porsild ex M. P. Porsild in Can. Field-Nat. **60** : 85 (1946); Porsild in Can. Field-Nat. **64** : 17 (1950), map Tab. 2, fig. 19. (Plate XXXIII, figures 1 to 4)

Stolons creeping, freely branching; the older subterranean and subligneous, the younger ones sarmentose, 5 to 10 cm. long. Basal leaves oblanceolate-cuneate, tapering into a narrow petiole, mucronate, 2·0 to 3·0 cm. long, 0·5 to 0·6 cm. wide, obscurely 3-nerved, glabrate or glabrous and deep green above, sericeous-appressed tomentose below. Flowering stems 20 to 30 cm. high, slender, stiff or sometimes arcuate, thinly arachnoid-tomentose, glabrate and greenish purple. Stem leaves 15 to 20, linear-lanceolate, glabrate and fresh green, long acuminate but scarcely appendiculate, the lower 2·0 cm. long, the upper much smaller. Inflorescence lax cymose, nodding in youth, with from 5 to 8 pistillate heads on peduncles 0·6 to 1·0 cm. long. Involucres 0·6 to 0·7 cm. high, the phyllaries 3- to 4-seriate, conspicuously imbricated, thin and oblanceolate; the outer green with thinly lanate bases, the inner first beautifully roseate, later straw-coloured. Corolla with greenish tips. Style scarcely exserted. Achenes dusky brown, glabrous, or minutely and sparingly papillose. Pappus silky and snowy white. Staminate plant unknown.

Pass between Teslin and Nisutlin Rivers, alpine slopes of granite mountain, east of Mile 10-14, No. 11014; river-banks and alluvial flats west of Nisutlin River east of Mile 36-42, open spruce forest, No. 10868; east slope of Rose River valley, open, sandy pine forest near Mile 77, No. 10325; same place, alpine slopes, No. 10966; dry slopes of granite mountain east of Rose River opposite Mile 85-90, July 6, 1945, No. 10190 (Type); Rose River, outwash fan near Mile 95, No. 10446; Rose-Lapie Pass, open willow-covered slope east of Lapie Lake, Mile 105, No. 9326; same place, grassy slopes of sandy hill, No. 10633. Also from Bennett, Malte, No. 63; Watson Lake, Anderson & Brown, No. 9938 (Can), and from Dawson District: 30 Mile River, Williams, August 23, 1899 (NY); Alaska Highway: Rancheria, Anderson, No. 10475, in part.

A very attractive and remarkable species that forms small colonies, sometimes one metre in diameter. It inhabits sandy or gravelly, not too dry, places on granitic soil in the lowland.

Antennaria alborosea is closely related to *A. acuminata* Greene (from Chilliwack Valley, B.C.) from which it differs by its always glabrous and deep green upper leaf surfaces and by the more reduced cauline leaves and larger heads; it is closely related to *A. leuchippi*, which, however, lacks the pink inner phyllaries and has permanently tomentose leaves.

In view of the better material now available it is evident that the plant recorded by the writer from Great Bear Lake (Sargentia **4** : 73 (1943)) as *A. rupicola* Fern. is actually *A. alborosea*. In *A. rupicola* the bracts are described as having "conspicuous yellowish-white firm papery tips exceeding the dark bases." The specimens from Bear Lake were collected late in the season, and the bracts now show only a faint trace of pink. *A. rupicola* is said to be a limestone plant, whereas *A. alborosea* was found only on neutral or acid soils.

Antennaria alborosea flowers during late June and early July when the bracts of the flowering heads are deep rose and very showy; later in the season the bracts fade to a pale pink. The young flowering heads are nodding.

General distribution: Southeast Yukon east to Great Bear Lake.

Antennaria Breitungii Porsild in Can. Field-Nat. **64** : 18 (1950), map Tab. 2, fig. 20.

Humifuse, with creeping and freely branching subligneous stems and leafy stolons up to 8 cm. long. Basal leaves narrowly spatulate-obovate, 5 to 7 mm. long and 2 to 3 mm. broad; in youth cinereous tomentose on both sides, but in age becoming totally glabrous above. Flowering stems 8 to 12 cm. high, bearing 8 to 10 linear-oblong leaves entirely lacking scarious appendages. Inflorescence, nodding in youth; pistillate heads 4 to 8, densely glomerate. Involucres 5 to 6 mm. high, their phyllaries 3-seriate, pink. Achenes sparingly but distinctly papillose. Staminate plant unknown.

Lower Lapie River crossing, dry shaly slopes at Mile 132, Nos. 9451 and 9493; Whitehorse, sandy bluffs east of Lewes River, No. 9229 (Type), same place, Anderson, No. 9596 (Can). Also from south end of Lake Kluane, Anderson, No. 9513 (Can), and from a single station in Alaska: Anchorage, Eklutna Lake, Dutilly, Lepage & O'Neill, No. 21089 (Can).

Antennaria Breitungii is named for August Breitung who accompanied the writer in the field for several seasons and contributed large series of splendid material of many rare and several new species of *Antennaria*. *A. Breitungii* differs from all other pink-flowered species of our area by its short, somewhat crowded basal leaves that in age become perfectly glabrous above. In habit, it resembles *A. nitida* but is at once distinguished from this species by its pink phyllaries and by the character of the tomentum. It grows on dry sandy slopes and flowers very early.

General distribution: Known only from the stations given above.

Antennaria elegans Porsild in Can. Field-Nat. **64** : 18 (1950), map Tab. 3, fig. 22. (Plate XXXIV, figures 1 to 6)

Humifuse, with well-developed, creeping and freely branching, subligneous stolons. Basal leaves spreading, linear-oblanceolate, acute, 10 to 20 mm. long, 2 to 3 mm. wide, thinly silky-tomentose on both sides. Flowering stems, slender and thinly floccose, 12 to 18 cm. high, bearing about 10 appressed-tomentose, linear-lanceolate leaves, 10 mm. long and 2 mm. broad; the lower ones more or less obtuse, the uppermost one or two with thin, scarious tips. Pistillate heads from 1 to 8, but usually 4, loosely glomerate at the time of florescence, but soon after the lowermost peduncles elongate so that the inflorescence becomes flat-topped, or the lateral heads may even overtop the central ones. Involucres 5 to 6 mm. high, their phyllaries in 3 or 4 rows, at first densely imbricated, later somewhat spreading. The outer phyllaries ovate with thinly lanate, brownish bases and stramineous tips, the inner oblong-lanceolate, acuminate and erose, at first pale pink, later becoming straw-coloured. Corolla lobes greenish. Styles barely exserted. Achenes brown and smooth. Staminate plant unknown.

Pass between Teslin and Nisutlin Rivers, rocky, alpine slope east of Mile 10-14, elevation 5,000 feet, No. 11015; dry meadow or prairie on alluvial flat west of Nisutlin River, opposite Mile 36-42, No. 10865; Rose River valley, dry alpine slopes east of Mile 77, No. 10967; rocky slopes of granite mountain east of Mile 85-90, elevation 5,000 feet, No. 10189; upper Rose River, dry gravel benches, Nos. 10411 (Type) and 10414; steep west slope of granite range east of upper Rose River, opposite Mile 95, No. 10523; south shoulder of Mount Sheldon, in open fir forest near timber-line, elevation 5,000 feet, No. 11644; same place, grassy slopes above timber-line, No. 11639.

Antennaria elegans is a rather attractive species, well marked by its matted growth, narrow, appressed-sericeous tomentose and spreading basal leaves; its slender, up to 20 cm. tall, and often somewhat flexuous stems; and by its numerous, rather ample, oblanceolate, obtuse stem leaves of which all but the topmost lack scarious appendages. In life, the young inner phyllaries are pale rose but soon turn pale grey or straw-coloured.

Antennaria elegans is a common species on the lower slopes of granitic mountains in southeast Yukon, reaching to timber-line or slightly above. The species was first collected on Great Bear Lake, N.W.T., where it was erroneously reported by the writer, in Sargentia **4** : 71 (1943), as *A. isolepis* (A. E. and R. T. Porsild, Nos. 3440, 3516, and 5085, Can).

General distribution: Mountains of southeast Yukon and Great Bear Lake.

Antennaria incarnata Porsild in Can. Field-Nat. **64** : 19 (1950), map Tab. 3, fig. 23. (Plate XXIX, figures 1 to 3)

Humifuse, with subligneous, freely branching, 3 to 5 cm. long, suberect-ascending stolons. Basal leaves oblanceolate or spatulate, acute, 10 mm. long and 3 mm. wide, on both sides covered by a grey, silky tomentum. Flowering stems 10 to 12 cm. high, adpressed silky-tomentose, bearing 7 to 8 linear, 10 to 15 mm. long and 2 mm. broad leaves; their tips acute or attenuate lacking scarious appendages. Inflorescence subglobose with from 5 to 8 heads on non-glandular peduncles of which the lowermost are sometimes branched. Involucres 5 mm. high, their phyllaries almost of equal length and arranged in 2 or 3 series; the exterior greenish and densely lanate below and with pink tips, the interior oblong-lanceolate, pale roseate, in life purplish-puncticulate. Corolla lobes pale purplish. Styles exserted. Achenes smooth. Staminate plant unknown.

Turfy river terraces of upper Rose River near Mile 95, elevation 3,600 feet, July 11, 1944, No. 10412 (Type); same place, gravelly outwash plain, No. 10445.

A rather attractive and distinct little species which forms small but rather dense colonies in turfy places on river terraces, outwash plains, and in open birch thickets.

Antennaria incarnata, by its much smaller size alone, is easily distinguished from *A. alborosea* and from the somewhat polymorphous *A. rosea*. Also, *A. incarnata* has more numerous and smaller heads than *A. rosea*. It rather closely resembles *A. groenlandica* of southwest Greenland from which it differs by its always pink phyllaries that lack the dark spot at the base of the outer row.

General distribution: Southeast Yukon.

Antennaria isolepis Greene; Porsild in Can. Field-Nat. **64** : 19 (1950), map Tab. 3, fig. 24.

Rose River valley opposite Mile 77, open, dry pine forest, No. 10324; granite mountain east of Rose River, opposite Mile 85-90, No. 10194; Rose-Lapie River pass, southwest slope of granite mountain west of Mile 116, Nos. 10092 and 10094A; same mountain, alpine screes west of Mile 118, No. 10152.

Rare or occasional in rather dry, rocky places, often far above timberline and apparently restricted to igneous, acid rocks.

Antennaria isolepis apparently is closely related to *A. pallida* from which it differs by its less ample stem leaves, the more densely matted indument of the basal leaves, its taller growth, and by the presence of sessile glands on the leaves and stems which make the entire plant somewhat viscid. Characteristic of this species are the well-developed, several millimetre-long, strap-like appendages to the stem leaves.

As stated by Fernald in Rhodora **26** : 102 (1924), the achenes in the eastern population of *A. isolepis* are "sparingly papillose," but in our material, as well as in all material seen by the writer from west of Hudson Bay, the achenes are perfectly glabrous. *See* also Porsild, Can. Field-Nat. **63** : 80-81 (1949). Greene's statement, l.c., "I suspect that the plant here described [the type] is male" is difficult to understand; the type, J. M. Macoun, 79270 (Can), now before me, consists of three plants with a total of nine well-developed pistillate inflorescences showing fully expanded flowers and almost mature achenes.

General distribution: Northern Labrador and Ungava(?), Northwest Territories north to Bear Lake, central Yukon and Alaska, south to mountains of northern British Columbia.

Antennaria Laingii Porsild in Rhod. **41** : 293 (1939), tab. 554, figs. 11-13; idem in Can. Field-Nat. **64** : 21 (1950), map Tab. 3, fig. 25.

Whitehorse, dry, sandy bluffs east of Lewes River, Nos. 9228 and 9231; Alaska Highway, Mile 893, between Whitehorse and Johnson Crossing, No. 11162; lower Lapie River crossing, shaly slopes near timber-line, elevation about 5,000 feet, No. 9753.

Antennaria Laingii is a species characteristic of dry, shaly or sandy foothills of Palæozoic rocks. It is undoubtedly closely related to *A. nitida* from which it differs by its short and stout rhizome, dull and densely canescent-tomentose, not at all silky, basal leaves, by its stiff and rather short flowering stems with well-developed leaves entirely lacking brown, scarious tips.

In 1944 the species did not fruit well, perhaps due to a tiny nematode-like worm that fed on the immature achenes in nearly all inflorescences examined.

General distribution: Dry interior of central Alaska and southern Yukon.

Antennaria leuchippi M. P. Porsild; Porsild in Can. Field-Nat. **64** : 21 (1950), map Tab. 3, fig. 26. (Plate XXXV, figures 1 and 2)

Whitehorse, July 11, 1944, A. & R. T. Porsild (Type); Johnson Crossing, M. P. Porsild, Nos. 542, 543, 544, 603, 639, 739, 740, and 741; Nisutlin River, Mile 39, No. 10866B; gravelly river-flats of upper Rose River near Mile 95, elevation 3,600 feet, Nos. 10415 and 10526.

A rather striking and attractive species which forms colonies of one metre or more in diameter on gravelly or sandy river-banks. It is, perhaps, most closely related to *A. alborosea* from which it differs by the permanent indument of the upper surfaces of the basal leaves, by its more numerous and smaller cauline leaves, by its smaller heads and white or, at most, pale pink inner phyllaries.

General distribution: Thus far known only from southeast Yukon.

Antennaria nitida Greene; Porsild in Can. Field-Nat. **64** : 22 (1950), map Tab. 3, fig. 27; *see* Fern. in Rhod. **26** : 101 (1924), tab. 142, fig. 9.

A. microphylla Rydb. in Torr. Bot. Cl. **24** : 303 (1897), not Gand.

Whitehorse, dry, shaly bluffs east of Lewes River, No. 10704; dry, open prairies on river-flats west of Nisutlin River, opposite Mile 36-42, No. 10866A; dry, stony banks of Rose River west of Mile 77, No. 10326; Rose-Lapie River pass, Mile 102, dry, grassy slopes of sandhills near headwaters of Lapie River, No. 9369; same place near Lapie Lake, Nos. 9814, and 9325; Rose-Lapie River pass, southwest slope of mountain west of Mile 116, Nos. 10093 and 10095; east slope of granite-schist mountain, Mile 118, dry, grassy slope near timber-line, No. 10149; lower Lapie River crossing, dry, shaly slopes near Mile 132, Nos. 9452, 9453, 9492, 9495, 9752, and 9754.

A common and widespread species on calcareous sedimentary rocks of the lowlands but, at least along the Canol Road, not seen on igneous rocks or their derivatives. In Yukon it is one of the earliest flowering species in the genus. In anthesis the outer bracts are of a dirty greenish red but soon turn ivory white. The species apparently does not fruit well. Typical *A. nitida* is easily recognized by its short, broad, obovate appressed, silky basal leaves and by its low, diffuse growth habit. No staminate plants were seen.

General distribution: From central Alaska through upper Yukon, Northwest Territories north to Bear Lake, east to James Bay, south to Saskatchewan, Alberta, and British Columbia, and in the Rocky Mountains south to New Mexico.

Antennaria oxyphylla Greene in Pitt. **4** : 284 (1901); Porsild in Can. Field-Nat. **64** : 23 (1950), map Tab. 3, fig. 26.

Pelly River valley, near Mile 136, in a dry, sandy meadow near a lake, No. 9860. Also Alaska Highway, Rancheria west of Whitehorse, Anderson, No. 10475, in part (S); Dawson District, Fiftymile River, June 28, 1899, Bolton (US).

Our plant, together with material from elsewhere in the Yukon, Alaska, and Lake Athabasca, differs from *A. oxyphylla* of the Rocky Mountains chiefly in the smaller and less numerous heads and in having pale pink phyllaries; in the Rocky Mountain plant the phyllaries by Greene, l.c., are said to be white.

Antennaria oxyphylla may be distinguished from all other northern pink-flowered species of *Antennaria* by its short offsets bearing 2 cm. long, spatulate-obovate, silvery grey leaves, 15 to 25 cm. tall and slender stems, and rather small heads. The phyllaries are in 4 rows, long-acuminate, narrow, and pale pink.

General distribution: Central Alaska and Yukon east and south to Lake Athabasca, and south through the Canadian Rockies to Nebraska and South Dakota.

Antennaria pygmaea Fernald in Rhodora **16** : 120 (1914); ibid., **26** : 99 (1924), tab. 142, figures 5 and 5a; Porsild in Can. Field-Nat. **64** : 23 (1950), map Tab. 3, fig. 29.

Granite mountain range west of upper Rose River opposite Mile 95, in an alpine meadow between 5,600 and 6,000 feet, No. 10584.

Our plant agrees very well with eastern material of *A. pygmaea*. It is at once distinguished from the female plant of *A. monocephala* by its large heads and straw-coloured phyllaries. From *A. philonipha* it differs by its stout and stiff flowering stems and by the absence of stolons.

General distribution: Northern Labrador, Ungava, Keewatin west to Mackenzie, and southeast Yukon.

Antennaria rosea (Eaton) Greene; Porsild in Can. Field-Nat. **64** : 24 (1950), map Tab. 3, fig. 30.

A. parvifolia Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901), at least in part.

Whitehorse, sandy bluffs east of Lewes River, No. 10705; Johnson Crossing, Mile 0, M. P. Porsild, Nos. 571, 573, 633, 636, and 738 (Can); grassy meadow in river-flat west of Nisutlin River near Mile 36-42, No. 10866; open, sandy pine woods, east slope of Rose River valley, Mile 77, Nos. 10323 and 10327; steep grassy west slope of granite range east of Mile 95 on upper Rose River, No. 10525.

A common species on grassy slopes and in open, sandy woods of low altitudes.

The large material in the above series is rather uniform with strongly developed, long, ligneous and freely branching rhizomes; the branches are erect or ascending, each ending in a leafy rosette which the next year produces a flowering stem. Adventitious roots appear on the subterranean part of the branches in the third year. The basal leaves are oblanceolate, acute about 2·0 cm. long and 0·4 cm. wide, with a densely appressed, pale yellowish green tomentum, often involute in age. The old leaves persist for several years. The flowering stems are rather weak, 10 to 15 cm. high with 8 to 10 linear, 2·0 cm. long, acuminate leaves, all without scarious appendages. The inflorescence is rather compact with 3 to 5 heads in a hemispherical cyme. The bracts are of unequal length, in 3 series; the outer ones pale greenish and lanate, the inner linear lanceolate and acuminate, pink, soon fading. The pappus is dirty white, the styles not exserted, and the achenes glabrous. No male plant was seen.

General distribution: Yukon south to California east to James Bay.

Antennaria subviscosa Fernald; Porsild in Can. Field-Nat. **64** : 24 (1950), map Tab. 3, fig. 31. *See* Fernald in Rhod. **16** : 131 (1914); ibid., **26** : 102 (1924), tab. 142, fig. 10.

Rose-Lapie River pass; in meadows and on grassy slopes near Mile 102, with mature fruiting heads on July 19, No. 10634; southwest slope of granite-schist mountain west of Mile 116, Nos. 10090 and 10094; lower Lapie River crossing, elevation 2,750 feet, open, park-like spruce forest, No. 9973.

Our plant differs from typical *A. subviscosa* in having the achenes perfectly glabrous but, otherwise, is a close match for the type from Gaspé, Que. Our plant is probably closely related to *A. albescens* (Nels.) Rydb. of the Rocky Mountains but lacks the strongly developed rhizome and pulvinate habit of that species.

Antennaria subviscosa in Gaspé grows on calcareous cliffs; our plant was found only in the north end of the Rose-Lapie Pass where it was associated with calciphiles found nowhere else in the district.

General distribution: Gaspé, Que., Lake Athabasca, and mountains of southeast Yukon.

Gnaphalium uliginosum L., Sp. Pl. 856 (1753).

Mayo by roadsides, Anderson, No. 9740.

Helianthus laetiflorus Pers. var. **subrhomboideus** (Rydb.) Fern. in Rhod. **48** : 79 (1946).

Dawson, Malte, No. 67.

A casual introduction which, thus far, in Yukon has not been collected elsewhere.

Madia glomerata Hook., Fl. Bor.-Am. **2** : 24 (1824).

Dawson District, Hunker Creek, Macoun, Can, No. 91084.

A casual introduction.

Anthemis Cotula L., Sp. Pl. 894 (1753); Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901).

Introduced at Dawson, Macoun, Can, No. 91085; Malte, No. 366.

Achillea Millefolium L., Sp. Pl. 899 (1753); Macoun in Ott. Nat. **13** : 213 (1899).

According to Macoun, l.c., collected by J. B. Tyrrell on Chandindu River near Dawson. The writer has not seen the specimen which is not now in the Ottawa Herbarium. If occurring in Yukon, *A. Millefolium* undoubtedly is introduced.

Achillea nigrescens (E. Mey.) Rydb. in N. Am. Fl. **34** : 221 (1916).

A. Millefolium L. var. *nigrescens* E. Mey., Pl. Labrad. 65 (1830).

A. borealis Bong. in Mém. Acad. St. Petersb. **6**, 2 : 149 (1832), at least as regards the arctic plant.

A. lanulosa Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901), not Nutt.

A. Millefolium L. var. *lanulosa* Ostf., Gjöa Exp. 67 (1909), not *A. lanulosa* Nutt.

A. subalpina Greene in Leaflets **1** : 145 (1905); Rydb. in N. Am. Fl. **34** : 222 (1916), at least as regards plant of Yukon.

Whitehorse, Ear Lake, M. P. and R. T. Porsild, No. 47; Johnson Crossing, M. P. Porsild, No. 414; alluvial flats along west bank of Nisutlin River, Mile 36-42, No. 10869; upper Rose River, on gravelly outwash fan near Mile 95, No. 10417; Rose-Lapie Pass, southwest slope of mountain west of Mile 116, elevation 5,000 feet, No. 10078; Ross River valley, near north end of Sheldon Lake, Mile 222, No. 11581.

A common species in Yukon, noted everywhere on dry slopes, on gravelly river-flats, and frequently as recently established along roadsides, from Whitehorse to Macmillan Pass. Flowering specimens were first noted early in July; the flowers are strongly perfumed.

Achillea nigrescens in Yukon is a polymorphic species which varies greatly according to its habitat in regard to degree of pubescence, cut of leaf, and the shape of leaf-segments. Even the shape, the pubescence, and the coloration of the bracts, which is frequently used as a key character, vary considerably and often within a local population.

Thus, the writer has been unable to detect any consistent difference between the eastern plant, described from Labrador, which has commonly been called *A. Millefolium* L. var. *nigrescens* E. Mey. and the western arctic plant, which has passed as *A. borealis* Bong. Likewise, the Yukon plants which by Rydberg, l.c., were reported as *A. lanulosa* or as *A. subalpina* seem best referred to *A. nigrescens*.

The North American range of *A. nigrescens* as thus interpreted is from southern Labrador and Newfoundland to Alaska, north approximately to the tree limit, but reaching the Arctic Coast at the Mackenzie Delta, south to mountains of New Hampshire and to New Mexico. The plant of south Greenland, according to M. P. Porsild, Medd. om Grl. **134**, 4 : 36 (1946), is *A. Millefolium* L.

Achillea sibirica Ledeb., Ind. Sem. Hort. Dorpat (1811).

A. multiflora Hook., Fl. Bor.-Am. **1** : 318 (1834); Rydb. in N. Am. Fl. **34** : 226 (1916).

In Yukon known from several collections from Dawson District: John Macoun, Nos. 79025 and 79026; ibid., Malte, No. 131; ibid., Eastwood, No. 518A, and from Mayo, Anderson, No. 9702. Rydberg's statement that this species occurs on "the Arctic Coast" is, no doubt, erroneous; on the Mackenzie *A. sibirica* extends north only to the head of the delta.

We did not see it along the Canol Road.

Matricaria ambigua (Ledeb.) Kryl., Fl. Alt. **3** : 625 (1904); *See* M. P. Porsild in Medd. om Grl. **92, 1** : 72 (1932).

M. inodora L. var. *grandiflora* (Hook.) Ostf. in Gjöa Exp. 25 and 68 (1909); Macoun & Holm, Rept. Can. Arct. Exp. **5**-A : 21 (1921).

Herschel Island, Stringer, Can, 62231; ibid., Can. Arct. Exp., No. 227.

In Yukon, as elsewhere within its range, this arctic species appears to be restricted to the sea-coast where it is a common species.

Matricaria suaveolens (Pursh) Buchen., Fl. Bremen. 142 (1894).

Whitehorse, Anderson, No. 8925; Johnson Crossing, M. P. Porsild, No. 582; Dawson Hill, Macoun, Can, No. 91086; Dawson, Eastwood, No. 436.

An introduced species which is common in waste places and near towns.

Chrysanthemum arcticum L., Sp. Pl. 889 (1753); Macoun & Holm, Can. Arct. Exp. **5** : 21A (1921); Porsild in Sargentia **4** : 73 (1943).

Arctic Coast, Shingle Point, Can. Arct. Exp., No. 185.

A littoral species which is common along the Arctic Coast but not reported from any interior station throughout its North American range.

Chrysanthemum integrifolium Richards. in Frankl. 1st. Journ. App. vii: 749 (1823).

Southeast Yukon, Alaska Highway, Summit Mountain, elevation 6,000 feet, Nos. 9021 and 11947. Also Alaska-Yukon Boundary, 66° 37′ N., Cairnes, Can, No. 81550.

Not seen by us along the Canol Road until east of the Yukon-Mackenzie Divide where it was common on limestone mountains.

Chrysanthemum integrifolium is probably common in the Ogilvie Range and on mountains of northern Yukon.

Tanacetum bipinnatum (L.) Schultz-Bip., Tanac. 48 (1844); Rydb. in N. Am. Fl. **34** : 239 (1916).

T. Huronense Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 185 (1901), not Nutt.

Yukon River at Selkirk, Gorman, No. 1102; Dawson, Williams, July 30, 1899; ibid., Macoun, Can, No. 91087 and Eastwood, No. 537. Also from central Alaska and Mackenzie Delta (Porsild).

Apparently a northwestern species which is distinguished from the northeastern *T. huronense* var. *bifarium* Fern. Rhod. **37** : 334 (1935) mainly by its larger and more reflexed ligules of the ray flowers.

In Yukon the species appears to be restricted to the Yukon drainage.

Artemisia alaskana Rydb. in N. Am. Fl. **34** : 281 (1916); Hall & Clements, Carn. Inst. Wash. **326** : 68, tab. 5, figs. 8-13 (1923).

A. Tyrrellii Rydb. in N. Am. Fl. **34** : 262 (1916); Porsild in Rhod. **41** : 297 (1939).

Rose-Lapie Pass, shaly cliffs on mountain east of Mile 105, elevation 5,000 feet, No. 10930; rocky upper slopes of mountain west of Mile 116, No. 10097; lower Lapie Crossing, dry shaly slopes west of Mile 132, No. 9751; same place, rocky ledges at summit of mountain south of Mile 132, elevation 5,600 feet, No. 9950. Also south end of Kluane Lake, Anderson, Nos. 9361 and 9385; Alaska Highway at White River, idem, No. 9339.

Rare or occasional on dry, calcareous cliffs in the Pelly Range where the first fully expanded flowers were noted on July 21. The entire plant is strongly aromatic, like *A. frigida.*

Artemisia alaskana is an endemic of mountains of Alaska, Yukon, and northern British Columbia; in the Pelly Range ascending to 5,600 feet. The type came from the lower Yukon, between Nulato and Nowikakat and by Rydberg, l.c., as well as by Hall & Clements, was considered close to the Siberian *A. Turczaninoviana* Bess. It has been collected recently on a number of mountains in central Alaska where it was reported by Scamman (1940), and as *A. ? Tyrrellii* by the writer (1939). The latter species was based on a mere fragment collected by J. B. Tyrrell on the Selkirk Trail, northern British Columbia (Can, No. 19439). Although Rydberg placed *A. Tyrrellii* in the subsection NORVEGICAE to which Hall & Clements, l.c., p. 61, agree, and *A. alaskana* in subsection RUTAEFOLIAE, a comparison of the type of *A. Tyrrellii* with the large series of *A. alaskana,* now before the writer, leaves little doubt that they are one and the same species. Consequently, *A. Tyrrellii,* which preceded *A. alaskana* by 19 pages, should really take priority over the later name, but inasmuch as the true identity of *A. Tyrrellii,* based as it is on a single and very fragmentary collection lacking basal leaves and rhizome, is open to doubt, it would seem preferable to discard that name for the better understood, well typified *A. alaskana* (US, 41571), of which a photograph is before the writer.

In addition to the British Columbia and Yukon specimens cited, the following Alaska specimens are in the National Herbarium of Canada: Slana-Tok Highway, Mile 36, Anderson, No. 8695; Franklin, Fortymile district, idem, No. 7120; Wiseman, idem, No. 6003; same place, E. Scamman, Nos. 984 and 2300; Kokrines Mountains, A. E. and R. T. Porsild, No. 805; Seward Peninsula, idem, Nos. 1284–1286 (the last four distributed as *A.* ? *Tyrrellii*). *A. alaskana* is new to the flora of Canada.

Artemisia arctica Less. in Linnaea **6** : 213 (1831); Porsild in Sargentia **4** : 73 (1943).

A. laciniata Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 186 (1901).

A. macrobotrys, Rydb. in N. Am. Fl. **34** : 264 (1916).

A. comata Rydb., ibid., p. 263; Macoun & Holm, Rept. Can. Arct. Exp. **5** : 22A (1921).

A. longipedunculata Britt. & Rydb., l.c., p. 186.

Pass between Teslin and Nisutlin Rivers, M. P. and R. T. Porsild, No. 696; upper Rose River, alpine slopes west of Mile 95, elevation 5,000 feet, No. 10230; lower Lapie Crossing, alpine slopes above timber-line on mountain west of Mile 132, No. 9748. Also arctic coast of Yukon, A. E. Porsild, Nos. 6911 and 7199; mountains north of McQuesten River, Christie, No. 99; Klondike Indian Divide, Macoun, Can, No. 79008; Yukon River, Ogilvie, Can, No. 14629; Dawson Range, Bostock, No. 13; Kluane Lake, elevation 6,000 to 7,000 feet, Clarke, No. 290.

An arctic-alpine species which was noted as common or even dominant on snowflushes and on moist, grassy slopes above timber-line. On Mount Sheldon ascending to the very summit at 7,200 feet. In the Pelly Range, *A. arctica* flowered on June 20 at 5,600 feet.

Artemisia arctica is common in mountains of Alaska and Yukon as far as the east slope of the Mackenzie Range but thus far has not been collected east of Mackenzie River; from the Arctic Coast it extends south through mountains of British Columbia and Alberta to Washington. Throughout its range it varies considerably according to the habitat, from the dwarf forms of the Arctic Coast (*A. comata*) to giants 75 cm. high with 8 to 10 cm. long peduncles (*A. longipedunculata*). *A. macrobotrys* reported by Rydberg, l.c., is based upon a single collection from Fort Selkirk in the Yukon (Tarleton, No. 111) which Britton and Rydberg, l.c., originally had reported as *A. laciniata* Willd. The writer has not seen the specimen, but an examination of *A. macrobotrys* Ledeb. Ic. Fl. Ross., tab. 467, suggests that Tarleton's plant may be nothing more than a slender form of *A. arctica*.

Artemisia borealis Pall., Reise **3** : 755 (1776).

? A. canadensis Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 186 (1901).

? A. MacCallae Rydb., N. Am. Fl. **24** : 254 (1916).

? A. camporum Rydb., ibid., p. 254.

A. spithamea Pursh.

Whitehorse, sandy bluffs and hillsides east of Lewes River, No. 10702; Rose-Lapie Pass, meadows and grassy slopes near headwaters of Lapie River, Mile 102, No. 10631; lower Lapie Crossing, dry shaly slopes west of Mile 132, Nos. 9489 and 9750; gravelly river-flats near Mile 132, No. 10046.

In Yukon, *A. borealis* apparently is limited to the upper Yukon drainage where it is restricted to calcareous, sandy, and shaly slopes. In Yukon previously known from Lewes River, Ogilvie (Can, No. 14567); Whitehorse, Anderson, No. 9665; Dawson, Malte, No. 64; Yukon River, 15 miles below Dawson, E. & J. Lohbrunner, July 11, 1936; Dawson Trail, Tyrrell (Can, No. 100649).

All specimens seen by the writer from interior Yukon are taller and more stiffly erect than is typical *A. borealis*; furthermore the inflorescence is open and paniculate with numerous heads that average 2·5 to 3·5 mm. in diameter and have more or less glabrous and translucent bracts. The series listed above is a close match for *A. borealis* from Athabasca Lake, Raup, Nos. 6709, 6718, 6747, 6914, and 6924, and in appearance resembles what generally passes as *A. canadensis* Michx. Fl. Bor.-Am. **2** : 128 (1803), which by Hall and Clemens is considered an unimportant variation of *A. campestris* L. *A. MacCallae, A. camporum*, and *A. spithamea*, reported by Rydberg, l.c., from Yukon, may belong here, too.

In this connection it may be of interest to note that the type locality of *A. canadensis* is "in arena mobili secus lacus, ad sinum Hudsonis" where to-day the most common *Artemisia* is *A. borealis*. In fact, Michaux's very short description admirably fits that species: "subdecumbens, parce pubescens: foliis planis, lineari-pinnatifidis: ramulis spicifloris; floribus majusculis, subhemisphaeris: calycibus scariosis". Rydberg probably realized that Michaux's plant differed from that of the plains when he segregated *A. camporum* from what had passed as *A. canadensis.*

Artemisia dracunculoides Pursh, Fl. Am. Sept. 742 (1814).

Lower Lapie River crossing, dry shaly slopes of mountain west of road, No. 9490. Also Carcross, Anderson and Brown, No. 10353; Kluane Lake, Anderson, No. 9480.

A plains or foothill species not previously recorded from Yukon.

Artemisia frigida Willd., Sp. Pl. **3** : 1838 (1804); Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 186 (1901).

Whitehorse, Anderson, No. 9479; Johnson Crossing, M. P. Porsild, No. 719; lower Lapie River crossing, dry, shaly slopes of mountain west of Mile 132, No. 9749; same place, gravelly river-flats and slopes, No. 9994. Also Pelly River, 61 degrees North, G. M. Dawson; Dawson, Eastwood, No. 518B; Klondike, Macoun, Can, 79016; Kluane Lake, No. 11952, and Clarke, No. 9360.

At Mile 132, *A. frigida* is a dominant species on dry gravel-plate screes below timber-line where it is browsed extensively by mountain sheep.

Artemisia Tilesii Ledeb. in Mém. Acad. Imp. Sci. St. Pétersb. **5** : 568 (1812).

A. vulgaris var. *Tilesii* Ostf., Gjöa Exp. 68 (1901); Macoun & Holm, Rept. Can. Arct. Exp. **5** : 22A (1921).

Rose-Lapie Pass, in spruce swamp near Mile 105, No. 9341; same place, southwest slope of mountain west of Mile 116 in a ravine above timber-line, elevation 5,000 feet, No. 10096; Macmillan Pass, Mackenzie-Yukon Divide, No. 11277. Also Arctic Coast, between King and Kay Points, Porsild, Nos. 7200, 7201, and 7202; Herschel Island, Can. Arct. Exp., No. 235, and Kluane Lake, Anderson, No. 9478.

Artemisia Tilesii in Yukon is an arctic-alpine species found chiefly along the Arctic Coast and on high mountains of the interior. Its low but rather stout stems are ascending from a strongly developed rhizome, the upper leaf surfaces are somewhat tomentose, and the leaf-segments tend to be broader. The inflorescence is racemose or spike-like. In the interior, *A. Tilesii* passes into the not too well-defined var. *elatior.*

Artemisia Tilesii Ledeb. var. **elatior** T. & G. Fl. N. Am. **2** : 422 (1843).

A. elatior Rydb. in Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 186 (1901).

Whitehorse, Anderson, No. 9666; Johnson Crossing, M. P. Porsild, Nos. 314 and 580; sandy river-banks along Nisutlin River west of Mile 36, No. 10864; Rose River valley, in sandy places on flood-plain near Mile 77, No. 10328; southwest slope of mountain west of Mile 116, in a ravine above timber-line, elevation 5,000 feet, No. 10147; Pelly River valley, under willows by a lake near Mile 136, No. 9861; south fork of Macmillan River, on grassy river-banks near Mile 250, No. 11439. Also Mayo, Anderson, No. 9703; Dawson, Malte, No. 66; Macoun, Can, Nos. 79011 and 79013.

Artemisia Tilesii var. *elatior* is common throughout the wooded parts of interior where it grows in the lowland, chiefly on flood-plains, river-banks, and lake shores, ascending only to timber-line where it usually is found in moist ravines and on freshly exposed soil flows. It differs from the species by its taller and more slender stems, narrower leaf-segments with glabrescent and green upper surfaces, and by its loosely, paniculate inflorescence.

East of the Mackenzie, the var. *elatior* extends to the west coast of Hudson Bay.

Petasites arcticus Porsild in Sargentia **4** : 74 (1943).

Arctic Coast between King and Kay Points, Porsild, No. 7208.

This species thus far is known only from the Mackenzie Delta region and the Arctic Coast from Anderson River west to King Point and south into Richardson Mountains. It may be expected also to occur in the mountains of northern Yukon. *P. arcticus* is perhaps most closely related to the Cordilleran *P. speciosus* (Nutt.) Piper, from which it differs by its perfectly glabrous leaves lacking the flat bristles of the upper leaf-surface, so characteristic of that species.

Petasites frigidus (L.) Fries, Summa Veg. Scand. 182 (1845); *See* Porsild, Sargentia **4** : 74 (1943); Britt. & Rydb., Bull. N.Y. Bot. Gard. **2** : 186 (1901).

P. gracilis Britt. in Britt. & Rydb., ibid.

P. hyperboreus Rydb. in N. Am. Fl. **34** : 312 (1927), as to plant "from Hudson Bay to Alaska", not as to type.

P. frigida var. *corymbosa* Ostf. in Gjöa Exp. 68 (1909).

Whitehorse, Anderson, No. 9648; pass between Teslin and Nisutlin Rivers, in treeless, alpine meadow, Mile 14, No. 11158; Rose River, in wet places in pine and spruce bogs near Mile 77, No. 10333; upper Rose River, alpine valley west of Mile 95, elevation 5,000 feet, No. 10229; Rose-Lapie Pass, in spruce bog near Mile 105, Nos. 9329 and 9342; in timber-line forest west of Mile 116, No. 10098; lower Lapie Crossing, grassy summit of mountain south of Mile 132, No. 9424; moist north slope of mountain west of Mile 132, elevation 5,600 feet, No. 9759; Pelly Valley, in a muskeg by a lake near Mile 136, No. 9675. Also from mountains north of McQuesten River, Christie, No. 97; Mayo, Anderson, No. 9736 and Bostock, No. 136; Dawson, Moosehide, Eastwood, Nos. 83 and 481; Alaska-Yukon Boundary, 64° 07′ to 66° 17′ N., Cairnes, Can, Nos. 93344 and 81556; Arctic Coast, King Point, Gjöa Exp.; Herschel Island, Can. Arct. Exp., No. 258; Kluane Lake, 6,000 to 7,000 feet elevation, Clarke, Nos. 287 and 288.

A common species in moist muskeg woods and on lake shores, occasionally ascending to or slightly above timber-line; in the Pelly Range to 5,600 feet. The species is somewhat variable and probably hybridizes with *P. sagittatus* (No. 9675). *P. gracilis* Britt. from Walker Gulch, Dawson district, is a slender shade form.

Petasites frigidus flowers very early, and by mid-June fruiting plants were noted. The flowers are strongly perfumed.

Petasites hyperboreus Rydb. in N. Am. Fl. **34** : 312 (1927), excl. pl. "from Hudson Bay to Alaska".

A Cordilleran-Pacific Coast species thus far collected a few times in Alaska, e.g. White Pass, Malte, No. 375, and along the Haines Road just south of the British Columbia - Yukon Divide, Clarke, No. 432.

Petasites palmatus (Ait.) Gray, Bot. Calif. **1** : 407 (1876).

In rich woods on alluvial flats west of Nisutlin River, Mile 39, No. 10870; Rose River, in pine and spruce bogs near Mile 77, No. 10331. Also Watson Lake, Anderson and Brown, No. 9939.

An eastern woodland species which has not previously been collected west of the upper Mackenzie Basin.

Petasites sagittatus (Banks) Gray, Bot. Calif. **1** : 407 (1876); Macoun in Ott. Nat. **13** : 214 (1899); Porsild in Sargentia **4** : 75 (1943).

Johnson Crossing, M. P. Porsild, No. 763; Pelly River valley, in wet alluvial flat amongst willows, Mile 136, No. 9786; Ross Valley, in wet sand in sheltered bay of Sheldon Lake, No. 11583. Also noted by us on the Nisutlin River, Mile 39, in the Ross-Lapie Pass and in Macmillan Pass. Also from Mayo District, Anderson, No. 9737; Fort Selkirk, Gorman, No. 965, and, according to Macoun, collected by Tyrrell on the Klondike.

An eastern lowland species which apparently is rare and local in Yukon and which barely has entered Alaska.

Petasites vitifolius Greene in Leafl. **1** : 180 (1906).

Alluvial flats west of Nisutlin River, in wet places in spruce forest, Mile 36, No. 10871; densely wooded east slope of Quiet Lake, Mile 55-60, No. 11123; east slope of Rose River valley, in spruce and pine bogs near Mile 77, Nos. 10332 and 10334; southeast slope of Mount Sheldon, in shaded ravines near timber-line, No. 11733.

A rare woodland species not previously recorded from Yukon but known from Gaspé, Que., west to northern British Columbia (Alaska Highway, Swift River, No. 9120; Minaker River, latitude 57° 25′ N., and 122° 50′ W., Clarke, No. 32), south to Alberta and Minnesota. On Mount Sheldon ascending to 5,000 feet but not seen in the adjacent lowland.

Arnica alpina (L.) Olin ssp. **angustifolia** (Vahl) Maguire in Madroño **6** : 153 (1942); idem, Brittonia **4** : 410 (1943).

A. alpina Ostf. in Gjöa Exp. 69 (1909).

Upper Rose River, alpine valley west of Mile 95, elevation 5,000 to 6,000 feet, No. 11942; Rose-Lapie Pass, dry sunny scree west of Mile 118, No. 10146; lower Lapie River crossing, rocky summit of mountain south of Mile 132, elevation 5,600 feet, Nos. 9634 and 9947; dry shaly slopes west of Mile 132, No. 9756; Pelly River valley, on clay bank by small lake near Mile 136, Nos. 9787 and 9862.

Occasional to common on dry alpine slopes of the Pelly Range where it appears to be restricted to calcareous soils. Specimens from high altitudes closely match the typical arctic plant. The last two numbers represent a lowland form, 30 to 50 cm. tall, apparently always with a single large head, 5 to 6 cm. in diameter. Its leaves are somewhat longer petioled than usual and like the stem, soft and long pubescent. Flowering specimens were collected on June 15 at 5,600 feet elevation.

In the Yukon, previously collected on the Arctic Coast, King Point, Godfred Hansen; Alaska-Yukon Boundary, latitude 65° 58′ N., D. D. Cairnes. No. 61; idem, 65° 18′ N., 141° W. (all Can).

Arnica alpina (L.) Olin ssp. **attenuata** (Greene) Maguire in Madroño, **6** : 153 (1942); idem, Brittonia **4** : 412 (1943).

A. attenuata Greene in Pitt. **4** : 170 (1900).

The following Yukon specimens are in the National Herbarium of Canada: Lewes River, Gorman, No. 1025 (isotype); Klotassin area southwest of Yukon, between Selkirk and White River, D. D. Cairnes (Can, No. 91873); between Whitehorse and Eagle, E. & J. Lohbrunner, No. 116; Cemetery Hill, Dawson, Eastwood, No. 423 (as *A. Chamissonis*). We did not detect this subspecies along the Canol Road.

Arnica alpina (L.) Olin ssp. **tomentosa** (J. M. Macoun)Maguire in Madroño **6** : 153 (1942); idem, Brittonia **4** : 413 (1943).

A. tomentosa Rydb. in N. Am. Fl. **34** : 330 (1927).

Pass between Teslin and Nisutlin Rivers, stony alpine summit east of Mile 14, elevation 6,000 feet, No. 11053; Rose-Lapie Pass, rocky summit east of Mile 105, elevation 5,600 feet, No. 10932.

A rare alpine-arctic plant long known only from southern Canadian Rockies and from Newfoundland but lately recorded also from northern British Columbia, the Mackenzie Basin, and Alaska. The present collection confirms Rydberg's hitherto questionable record from southern Yukon (l.c.).

As noted by Maguire, l.c., ssp. *tomentosa*, near the northern limit of its range, lacks the dense woolly indument of the leaves, so characteristic in the plant of the southern Canadian Rockies.

Arnica Chamissonis Less. in Linnaea **6** : 238 (1831). *See* Maguire in Brittonia **4** : 460-66 (1943).

Johnson Crossing, M. P. Porsild, No. 761; alluvial flats along west bank of Nisutlin River, Mile 36-42, No. 10872; Rose River valley, riverbanks near Mile 77, No. 10321; upper Rose River, in flood-plain meadows near Mile 95, No. 10424; Rose-Lapie Pass, in subalpine meadows near headwaters of Lapie River, Mile 102, elevation 3,600 feet, No. 10632; northeast spur of Mount Sheldon, in deep loamy soil in subalpine meadows near Mile 226-7; Nos. 11494 and 11495. Also from southwest Yukon, Clarke, No. 357.

Our specimens lack the "coarse, moniliform hairs of the periclinium" which, according to Maguire, l.c., characterizes ssp. *genuina*; they probably most closely match ssp. *foliosa*. The last number, however, in all other respects is a close match for *A. Chamissonis* ssp. *genuina* from southwest Alaska.

In southeast Yukon, *A. Chamissonis* is restricted to relic prairie and to certain types of subalpine meadows where it grows in deep, loamy soil, often associated with *Polemonium acutiflorum*, *Mertensia paniculata*, *Artemisia Tilesii* var. *elatior*, *Geum macrophyllum* ssp. *perincisum*, *Delphinium glaucum*, and others. It flowers late, from the middle of July, and at Mount Sheldon still flowered on August 4.

In life, the entire plant is glutinous-clammy and stains the papers in the press.

The species is new to the flora of Yukon but has been recorded from the upper Mackenzie drainage (Raup, 1947). Besides, the species was collected at Liard Hot Springs by Anderson and Brown, No. 10375. A specimen from Lake Dezadeash in southeast Yukon by Maguire, l.c., has been doubtfully referred to ssp. *incana*.

Arnica cordifolia Hook. ssp. **genuina** Maguire in Madroño **6** : 154 (1942); idem, Brittonia **4** : 448 (1943).

Johnson Crossing, M. P. Porsild, Nos. 415, 590, and 634; Rose River valley, in spruce and pine bogs near Mile 77, No. 10320; upper Rose River, steep west slope of granite range east of Mile 95, in timber-line fir forest, elevation 5,000 feet, No. 10527; Rose-Lapie Pass, timber-line fir forest and alpine meadows on mountain east of Mile 105, elevation 5,000 feet, Nos. 9380, 9416, and 10933; in timber-line forest west of Mile 116, No. 10079; northeast shoulder of Mount Sheldon, in open fir forest, elevation 5,000 feet, No. 11103. Also from Dawson, Eastwood, No. 651A and Keno, Mayo District, Mrs. Black (both Can).

A pronounced Cordilleran species noted as common in moist *Abies lasiocarpa* forest where it ascends to, or slightly above, timber-line. In the lowland, it flowers from early July but at Mount Sheldon was still in full bloom on August 13.

Arnica latifolia Bong. in Mém. Acad. St. Pétersb. vi, **2** : 147 (1832); *See* Maguire in Brittonia **4** : 433 (1943).

Upper Rose River, in alpine meadow in valley west of Mile 95, elevation 5,000 feet, No. 10228; in dry creek bed near Mile 95, No. 10423; Rose-Lapie Pass, in alpine timber-line meadow east of Mile 105, No. 10934; northwest end of Itsi Range south of Macmillan River, Mile 252, in alpine meadow, No. 11394; upper south fork of Macmillan River, alpine slopes and snowflushes west of Mile 268, Nos. 11374 and 11375; Macmillan Pass, Mackenzie-Yukon Divide, in alpine herbmats among willows, Mile 284, No. 11269.

A pronounced Cordilleran alpine species noted as rare to occasional in alpine meadows north to Macmillan Pass. Flowering specimens collected on the Rose River at 5,000 feet on July 9.

The present collection constitutes a considerable extension of the known range of this species which, in the Northwest, had previously been recorded only from the Pacific coast of Alaska.

Arnica Lessingii Greene in Pitt. **4** : 167 (1900); Rydb. in N. Am. Fl. **34** : 328 (1927). *See* also Maguire in Brittonia **4** : 486 (1943).

Teslin and Nisutlin River pass, 10 miles above Johnson Crossing, M. P. and R. T. Porsild, No. 697; Rose River, alpine slopes above timberline east of Mile 85-90, elevation 6,000 feet, No. 10188; upper Rose River alpine valley and summits west of Mile 95, Nos. 10227 and 10582; steep rocky scree east of Mile 95, No. 10528; lower Lapie River crossing, grassy summit of mountain south of Mile 132, No. 9946; south shoulder of Mount Sheldon, grassy slopes above timber-line, elevation 4,500 to 6,000 feet, No. 11647; upper south fork of Macmillan River, in lichen heath above timber-line on mountain west of Mile 268, No. 11373. Also in Macmillan Pass (Porsild, 1945) and from Mayo District, 63° 46′ N., 134° 20′ W., Bostock, No. 144; Rambler Hill, McQuesten Lake, Cockfield, Can, 97692; 141st Meridian, latitude 67° N., Nelles, No. 20; Burwash Landing, Kluane Lake, Clarke, No. 291.

Common to occasional on high mountains where it grows in alpine lichen heath and on stony ridges; on Mount Sheldon ascending to 6,100 feet. Near Lapie River, *A. Lessingii* flowered on June 26 at 5,600 feet. Flowers and almost mature fruits were noted in Rose-Lapie Pass on July 7.

The species is new to the flora of Yukon but has been recorded from mountains of central Alaska, Richardson and Mackenzie Mountains of Northwest Territories, and from mountains of northern British Columbia (Porsild, 1939 and 1943; Raup, 1947).

Arnica lonchophylla Greene ssp. **genuina** Maguire in Brittonia **4** : 430 (1943).

A. lonchophylla Greene in Pitt. **4** : 164 (1900).

Whitehorse, dry, open pine woods east of Lewes River, No. 10701; ibid., M. P. Porsild, No. 124; Pelly Valley, on dry clay ridges in open aspen woods near Mile 138, No. 11176. Also from Mayo District, 63° 42′ N., 134° 30′ W., Bostock, No. 143; Alaska Highway, MacIntosh, Anderson and Brown, Nos. 10059 and 10060; White River, Anderson, No. 9293; Snag Airport, June 18, 1944, G. A. Noel.

Rare to occasional in dry prairies and in dry, open woods. The present series constitutes a considerable extension of the known range of this Rocky Mountain foothill species, previously known to beyond the Arctic Circle along the Mackenzie Valley. In the National Herbarium of Canada is a single specimen from Alaska: Franklin, Fortymile district, Anderson and Gasser, No. 7218, distributed as *A. Chamissonis*.

Arnica louiseana Farr ssp. **genuina** Maguire in Brittonia **4** : 419 (1943).

A. louiseana Farr in Ottawa Nat. **20** : 109 (1906).

A. nutans Rydb. in N. Am. Fl. **34** : 328 (1927).

Pass between Teslin and Nisutlin Rivers, alpine summits east of Mile 14, elevation 6,000 feet, Nos. 11016 and 11054; upper Rose River, in a rocky canyon west of Mile 95, No. 10467; Rose-Lapie Pass, alpine slopes of granite mountain west of Mile 116, No. 10080; lower Lapie Crossing, grassy summit of mountain south of Mile 132, Nos. 9635 and 9948; shaly ridges near summit of mountains west of Mile 132, elevation 5,600 feet, (growing with *A. alpina* ssp. *angustifolia*) No. 9755; dry, grassy river terraces near Mile 132, Nos. 9972 and 10047; northeast shoulder of Mount Sheldon, dry, rocky slopes above timber-line, elevation 5,500 feet, No. 11102.

Rare to occasional on high mountains of Pelly Range with an isolated station on Mount Sheldon.

Maguire, l.c., distinguishes three races of *A. louiseana*. In ssp. *genuina* of the Lake Louise region of the Canadian Rockies, the involucral bracts are said to be short-stipitate-glandular, and the achenes mostly glandular as well as scantily hirsute above; whereas in ssp. *frigida* of arctic and subarctic eastern Asia and Alaska, and in ssp. *Griscomi* of the Gaspé Peninsula and Newfoundland, the bracts are glabrescent above, scarcely glandular, and the achenes scarcely glandular.

As indicated by the long list of synonyms given by Maguire, ssp. *frigida* is a variable entity. Some forms even approach ssp. *genuina* by having stipitate glands on the involucral bracts; however, the northwestern population tends to have larger heads and to be a more robust plant than ssp. *genuina*. It is interesting to note that the population of *A. louiseana* that we found in the mountains of southeast Yukon more closely approaches the Cordilleran ssp. *genuina* than does *A. louiseana* of western Yukon. This is in agreement with the general trend of the flora of southeast Yukon, the affinity of which is markedly Cordilleran rather than Beringian. On the other hand, the plant which the writer found at the mouth of the Mackenzie and on Great Bear Lake (Porsild, 1943) is decidedly ssp. *frigida*, whereas that of the east slope of the Mackenzie Range (Porsild, 1945) is intermediate between ssp. *frigida* and ssp. *genuina*.

Even the series from southeast Yukon is not wholly uniform; the most remarkable variation is shown in No. 10467 in which the ray flowers are almost entirely tubular, with a very short ligule.

Arnica louiseana ssp. *genuina* is new to the flora of the Yukon. At Lapie River, flowering specimens were noted at 5,600 feet elevation on June 20.

Arnica louiseana Farr. ssp. **frigida** (Meyer ex Iljin) Maguire in Madroño **6** : 153 (1942); idem in Brittonia **4** : 417 (1943).

Alaska-Yukon Boundary, latitude 63° 50′, C. E. Cairnes (Can, No. 93348); Lake Kluane, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 292.

Arnica mollis Hook., Fl. Bor.-Am. **1** : 331 (1834). *See* Maguire in Brittonia **4** : 477 (1943).

In alpine meadows and "flower gardens" west of Mile 95 on the upper Rose River, elevation 5,600 feet, No. 10583.

A decidedly Cordilleran species recently discovered at Brintnell Lake on the east slope of Mackenzie Mountains, N.W.T., (Raup, 1947), but otherwise not known north of mountains of southern Alberta and British Columbia. Our specimens were in beginning anthesis on July 15-16 and grew in a rich alpine meadow associating with such essentially Cordilleran species as *Juncus Drummondii*, *Parnassia fimbriata*, *Leptarrhena pyrolifolia*, *Saxifraga Lyallii*, *Cassiope tetragona* ssp. *saximontana*, *Phyllodoce empetriformis*, *Valeriana sitchensis* a.o.

Arnica Parryi A. Gray ssp. **genuina** Maguire in Brittonia **4** : 481 (1943).

A. Parryi A. Gray in Am. Nat. **8** : 213 (1874).

Rose-Lapie Pass, rich alpine meadows above timber-line on mountain east of Mile 105, elevation 5,000 feet, No. 10935; southeast shoulder of

Mount Sheldon on dry, sunny slope above timber-line, elevation 5,000 feet, No. 11777.

In the Rose-Lapie Pass the species had flowers and almost mature fruits on July 21, and on Mount Sheldon fully mature specimens, 75 cm. high, were collected on August 17.

Like the preceding, a pronounced Cordilleran species, in Canada known from mountains of southern Alberta and British Columbia, with a single isolated station at Redfern Lake in northeast British Columbia (Raup, 1943).

Senecio atropurpureus (Ledeb.) Fedtsch. in Fedtsch. & Fler., Fl. Eur. Russ. 992 (1910); Porsild in Nat. Mus., Canada, Bull. **101** : 27 (1945).

Cineraria atropurpurea Ledeb. in Mém. Acad. St. Pétersb. **5** : 574 (1814), not *Senecio atropurpureus* Porsild in Rhod. **41** : 299 (1939).

Senecio frigidus (Richards.) Less. in Linnaea **4** : 239 (1831); Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 186 (1901); Ostf. Gjöa Exp. 70 (1909).

Cineraria frigida Richards. in Frankl. 1st. Journ. ed. 1, App. 748 (1823).

Lower Lapie Crossing, in open spruce woods near Mile 132, No. 9282; same place, in a muskeg, Nos. 9594 and 9845. Also Dawson, June 18, 1899, Williams (N.Y.); Eastwood, Nos. 390 and 394; Miller Creek, 64° N., 141° W., Cairnes, Can, No. 93338; Arctic Coast, Can. Arct. Exp., Nos. 187 and 226.

Typical *S. atropurpureus* has long, slender rhizomes and single, slender, few-leaved stems; the heads are small, most often discoid but frequently radiate; the radiate heads are strongly perfumed, with pale yellow ligules; the discoid ones are scentless.

This is a pronounced Asiatic arctic-alpine species which in North America is common on the arctic coast of Alaska east to Coronation Gulf and the westernmost arctic islands. It inhabits turfy, mossy places in low and rather wet lowland tundra. Inland it extends south to the forest-line and in Yukon and Alaska is found mainly in the mountains. In southeast Yukon, we found it in lowland muskegs where flowering heads were first noted on June 10.

Senecio atropurpureus (Ledeb.) Fedtsch. var. **Ulmeri** (Steffen) Porsild n.comb.

S. frigidus var. *Ulmeri* Steffen in Beih. 3. Bot. Centralbl. **58**, Abt. B : 104 (1938) Figs. 1, 2.

Upper Rose River, alpine valley west of Mile 95, elevation 5,000 feet, No. 11944; lower Lapie Crossing, grassy summit of mountain south of Mile 132, elevation 5,600 feet, Nos. 9631 and 9955; northeast shoulder of Mount Sheldon, elevation 5,000 feet, No. 11097. Also, Mayo District, north slope of ridge between Edwards and Nelson Creeks, elevation 5,000 feet, Bostock, No. 140; Kluane Lake, Burwash Landing, above timberline at 6,000 to 7,000 feet elevation, Clarke, No. 283. The following specimens from mountains of central Alaska are typical: Alaska Range, Broad Pass, A. E. and R. T. Porsild, No. 98; between Paxon and Summit, idem, No. 568; Kokrines Mountains, idem, No. 810.

The type of var. *Ulmeri* came from "Bender Cabin" near Circle Springs, Alaska, J. Ulmer, No. 40 (Herb. Steffen).

The var. *Ulmeri*, which apparently is limited to high mountains of interior Alaska and Yukon, is intermediate between typical *S. atropurpureus* and *S. Kjellmanii*. It has a rhizome similar or slightly stouter than *S. atropurpureus*, a stouter and more leafy stem, lacks long-petioled rosette leaves, and has much larger and mostly radiate, unscented heads; it flowers later than the species.

Senecio congestus (R. Br.) DC. Prod. **6** : 363 (1837). *See* Fernald in Rhod. **47** : 256 (1945).

S. palustris, Ostf. Gjöa Exp. 69 (1909).

Lower Lapie Crossing, in wet, peaty soil by a muskeg trail, Mile 132, No. 10042. Also from upper Pelly River, Pelly Banks, Dawson, Can, No. 14866; Alaska-Yukon Boundary, 63° N., Cairnes, Can, No. 93340.

An arctic species, common on the Arctic Coast but apparently rare in the interior where it was seen nowhere else by us.

The var. *palustris* (L.) Fern., on the other hand, has been collected in a number of places in Dawson District and Lake Bennett.

Our specimens flowered on June 30.

Senecio conterminus Greenm. in Ann. Mo. Bot. Gard. **3** : 101 (1916).

Mayo District, 63° N., 136° W., elevation 4,800 feet, Bostock, Nos. 231 and 232; Alaska Highway near White River, Anderson, No. 9344.

This species which was long known only from "Rocky Mts., near the Canadian Boundary, northward into Alberta and British Columbia" (Greenm., l.c.) has recently been recorded from several stations in central Alaska (Porsild, Rhod. **41** : 299 (1939).

Senecio cymbalarioides Nutt. var. **borealis** (T. & G.) Greenm. in Ann. Mo. Bot. Gard. **3** : 177 (1916).

Whitehorse, dry shaly banks of Lewes River, No. 9232; pass between Teslin and Nisutlin Rivers, M. P. Porsild, No. 330; lower Ross River, on dry, calcareous clay terraces, about Mile 150, No. 9702. Also from Mayo District, 63° 42′ N., 134° 30′ W., Bostock, No. 142.

Apparently a rare species in Yukon, known to the writer only from the above collection. It flowered abundantly on the lower Ross River on June 16.

Senecio hyperborealis Greenm., Monogr. Senecio, Teil **1** : 24 (1901), and Ann. Mo. Bot. Gard. **1** : 264 (1914); Porsild in Sargentia **4** : 76 (1943).

Whitehorse, M. P. Porsild, No. 125. Also Dawson, across Yukon ferry, Eastwood, No. 327. A rare and little known species, heretofore known only from the Mackenzie Basin and, as far as I am aware, not collected elsewhere in Yukon.

Senecio indecorus Greene in Fl. Francisc. 470 (1897). *See* Fernald in Rhod. **26** : 120 (1924).

S. discoideus Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 187 (1901).

Johnson Crossing, M. P. Porsild, Nos. 545 and 569; in wet flood-plain meadows west of Nisutlin River, Mile 34-42, Nos. 10873 and 10874; Pelly River valley, in wet, turfy places along a bulldozer trail near Mile 136, No. 9859; in wet alkaline meadow near Mile 138, No. 11177. Also from Dawson District, John Macoun, Can, Nos. 78974, 78975, and 78976; ibid., Eastwood, No. 457.

A southern lowland species which, along the Canol Road, was not noted north of Pelly River.

Senecio Kjellmanii Porsild in Rhod. **41** : 299 (1939).

Cineraria frigida Richards. f. *tomentosa* Kjellm., Vega Exp. Ventensk. Iakttag. **2** : 13, tab. 1 (1883), not *Senecio tomentosus* Michx.

S. frigida var. *tomentosus* Cufodontis in Fedde, Rep. Spec. Nov. **70** : 96, 98 (1933). (Plate VIII B)

Summit of granite mountain west of upper Rose River, Mile 95, elevation 6,000 feet, No. 11943; lower Lapie Crossing, grassy north slope near summit of mountain west of Mile 132, elevation 5,600 feet, No. 9758; Macmillan Pass, Mackenzie-Yukon Divide, in alpine tundra, elevation 5,500 feet, No. 11276. Also from north side of McArthur Range, elevation 5,000 feet, Bostock, No. 197, and Kluane Lake, Burwash Landing, elevation 6,000 to 7,000 feet, Clarke, No. 284.

A rare arctic-alpine species ranging from the Bering Sea region, east to Richardson Mountains west of Mackenzie Delta and south to the St. Elias Range. The typical plant, with its stout, branching rhizome, densely floccose stems and leaves, and large, showy heads, is a rather striking plant which is abundantly distinct from *S. atropurpureus* and its var. *Ulmeri*. *See* under that species.

Flowering specimens at Lapie Crossing at 5,600 feet elevation on June 20.

Senecio Lindstroemii (Ostf.) Porsild in Nat. Mus., Canada, Bull. **101** : 27 (1945).

S. integrifolius var. *Lindstroemii* Ostf., Kri. Vidensk. Selsk. Str. **8** : 70, tab. 3, fig. 20 (1910).

S. atropurpureus var. *subdiscoideus* Macoun & Holm in Rept. Can. Arct. Exp. **5**, 22A (1921).

S. atropurpureus Porsild in Rhod. **41** : 298 (1939), and Sargentia **4** : 76 (1943) Scamman, Rhod. **42** : 342 (1940), not *Cineraria atropurpurea* Ledeb. in Mém. de l'Acad. St. Pétersb. **5** : 574 (1814).

Arctic Coast, between King and Kay Points, Porsild, Nos. 7165, 7166, 7203, and 7205; Dawson Range, latitude 62° N., longitude 138° W., elevation 5,550 feet, Bostock, No. 14; same place, latitude 62° 35′ N., idem, No. 286; Alaska-Yukon Boundary, latitude 63° 45′ and 63° 50′ N., C. E. Cairnes, Can, Nos. 93336 and 93337.

A rare arctic-alpine species which apparently is endemic to northwestern North America where it ranges from Seward Peninsula along the Arctic Coast east to the Mackenzie Delta and the east slope of the Mackenzie Mountains with isolated stations on high mountains of interior Yukon and Alaska.

Senecio lugens Richards. in Bot. App. Frankl. Journ. 747 (1823); Britt. & Rydb. Bull. N.Y. Bot. Gard. **2** : 187 (1901).

Johnson Crossing, M. P. Porsild, Nos. 494, 495, and 523; Rose River valley, in pine and spruce bogs near Mile 77, No. 10330; alpine slope east of Mile 77, elevation 5,600 feet, No. 10962; Rose-Lapie Pass, open spruce woods near Mile 105, No. 9324; same place, by a mountain stream, No. 9819; rocky chimney west of Mile 118, elevation 5,000 feet, No. 10148; lower Lapie Crossing, moist north slope of mountain west of Mile 132, No. 9757; Pelly River valley, moist spruce forest near Mile 138, No. 9676; same place, edge of a muskeg, No. 9897; south shoulder of Mount Sheldon, in a ravine near timber-line, elevation 4,500 feet, No. 11637.

A common species throughout the Yukon to the Arctic Coast, which is rarely absent in mossy open woods and moist alpine slopes where it ascends at least to 5,600 feet. It varies considerably according to habitat; the basal leaves, which are always oblanceolate, may have acute or obtuse tips and may be coarsely dentate or quite entire. On Lapie River, *S. lugens* flowered on June 20, and on Mount Sheldon flowering specimens were still in evidence on August 7.

Senecio pauciflorus Pursh, Fl. Am. Sept. **2** : 529 (1814); Greenm. in Ann. Mo. Bot. Gard. **3** : 93 (1916). *See* also Fernald in Rhod. **26** : 119 (1924).

Whitehorse, M. P. and R. T. Porsild, No. 125A; Johnson Crossing, M. P. Porsild, Nos. 322 and 439; Rose River valley, in spruce and pine bogs near Mile 77, No. 10329; upper Rose River, in river-flat meadows near Mile 95, No. 10416; Rose-Lapie Pass, in subalpine meadow near Mile 105, No. 9818; south shoulder of Mount Sheldon, in wet thickets in saddle between Mount Riddell and Mount Sheldon, No. 11688. Also from "between Whitehorse and Eagle, along Yukon River," E. & J. Lohbrunner, No. 112. Previously reported from Yukon, without locality, by Fernald, l.c.

Rare to occasional in wet spruce forest, on river-flats and lake shores. On Mount Sheldon, ascending to 4,500 feet. Flowering specimens on Rose River on July 3.

Senecio pauperculus Michx. var. **Balsamitae** (Muhl.) Fern. in Rhod. **23** : 299 (1921).

Johnson Crossing, M. P. Porsild, Nos. 313 and 602; Alaska Highway near junction with Haines Road, 60° 50′ N., 137° 30′ W., Clarke, Nos. 354 and 355; Alaska Highway near White River, Anderson, No. 9295.

A lowland and prairie species which in Yukon apparently is restricted to the southern parts.

Senecio resedifolius Less. in Linnaea **6** : 243 (1831); Greenm. in Ann. Mo. Bot. Gard. **3** : 99 (1916); Rept. Can. Arct. Exp. 1913-18, **5A** : 22 (1921).

Arctic Coast, Herschel Island, Stringer, Can, No. 14390; ibid., Can. Arct. Exp. No. 242; north fork of Klondike River, Cockfield, No. 69; Dawson Range, 62° 35′–40′ N., and 138° 20′–30′ W., Bostock, Nos. 284 and 285; Lake Kluane, Burwash Landing, above timber-line, 6,000 to 7,000 feet elevation, Clarke, No. 282.

A pronounced calciphile which was not seen by us along the Canol Road until east of the Mackenzie-Yukon Divide where it was common on the limestones of the Mackenzie Mountains.

In addition to the stations given above, *S. resedifolius* in North America is known from the Bering Sea region, Richardson Mountains west of the Mackenzie Delta, and from Gaspé and Newfoundland.

Senecio sheldonensis Porsild in Can. Field-Nat. **64** : 45 (1950).

(Plate XXXVI, figures 1 and 2)

Slender, glabrous perennial with a short, many-headed but short-lived rhizome, lacking sterile, leafy rosettes. The leafy flowering stems simple, erect, 30 to 40 cm. high, bearing about 10 broadly lanceolate, repand-denticulate, glabrous, rather firm and obscurely veined leaves; the lowermost conspicuously petiolate, 6 to 10 cm. long (including petiole), the upper sessile, more or less clasping and much reduced. Inflorescence cymose, mostly composed of 3 (rarely 4) long-peduncled, turbinate, 12 to 17 mm. high and 8 mm. broad heads. Involucres 10 mm. high, glabrous; phyllaries about 12, linear, firm, with broad, hyaline margins and attenuate, conspicuously dark-coloured, pubescent tips. Ray flowers deep yellow, their ligules obtuse, 10 mm. long and 1 mm. broad. Disk flowers deep yellow, exceeding the white pappus. Achenes glabrous.

South shoulder of Mount Sheldon, in open timber-line forest in saddle between Mount Sheldon and Mount Riddell, elevation 4,500 feet, August 10, 1944, No. 11689 (Type); northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11492. Also from Mayo District, McArthur Mountains, near the hot springs, elevation 4,200 feet, Bostock, No. 196, and mountains north of McQuesten River, alpine meadow, 4,700 feet elevation, Christie, No. 126; McQuesten area, head of Sunshine Creek, 4,000 feet elevation, Campbell, No. 472. Also northern British Columbia: Bennett, Malte, No. 56; Haines Road, Mile 85, Clarke, No. 438.

Senecio sheldonensis is perhaps most closely related to the Eurasian *S. nemorensis* L., particularly to the few-headed var. *macer* (DC.) Printz., Veg. Sib.-Mong. Frontier 428, tab. 14, 1 (1921). [*S. octoglossus β macer* DC. in Prod. **6** : 354 (1837)] from Altai Mountains from which it is, however, amply distinct by its fewer and upwards much reduced, acute rather than long-accuminate stem leaves and by its broader and longer non-ciliate phyllaries, shorter ligules, etc.

From the somewhat polymorphous *S. triangularis* Hook. and its var. *trichophyllus* Hardin & St. John in Mazama **11** : 95 (1929), which is *S. saliens* Rydb. in Torr. Bot. Cl. **24** : 298 (1897) and also *S. prionophyllus* Greene in Ott. Nat. **15** : 250 (1902), as well as from *S. triangularis* var.

angustifolius Jones in Univ. Wash. Publ. in Biol. **5** : 257 (1936), *S. sheldonensis* differs by its more slender growth, weaker rhizomes, few-leaved stems and by its always lanceolate, never triangular-hastate and barely dentate leaves and by its dark-tipped phyllaries.

On Mount Sheldon *S. sheldonensis* grew in subalpine meadows associated with *Delphinium glaucum*, *Thalictrum sparsiflorum* var. *Richardsonii*, *Heracleum lanatum*, *Mertensia paniculata*, etc., in rather dry, turfy places quite unlike those preferred by *S. triangularis*.

Number 11689 had almost mature fruits on August 10, whereas, on a somewhat later and more shaded habitat, No. 11492 was in full bloom on August 8.

Senecio triangularis Hook., Fl. Bor.-Am. **1** : 332, tab. 115 (1834).

S. saliens Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 187 (1901).

Pass between Teslin and Nisutlin Rivers, in alpine meadow near Mile 14, No. 11157; Quiet Lake, steep, wooded east shore near Mile 55-60, No. 11122; alpine slopes east of Rose River, Mile 77, No. 10961; alpine valley west of upper Rose River, Mile 95, elevation 5,000 feet, No. 10225; Rose-Lapie Pass, timber-line meadows east of Mile 105, No. 9415; south shoulder of Mount Sheldon, in a ravine above timber-line, elevation 5,000 feet, No. 11636. Also from Mayo District, 63° 36′ N., 134° 37′ W., Bostock, No. 139; Lake Atlin, Eastwood, No. 678; Lake Lindemann, John Macoun, Can, No. 78962; Alaska Highway, Swift River, No. 9119.

A pronounced Cordilleran species noted as common in alpine meadows above timber-line along the Canol Road, north to Macmillan Pass. It is usually associated here with *Heracleum lanatum*, *Valeriana sitchensis*, *Veratrum Eschscholtzii*, etc., and flowers from first week of July.

Senecio vulgaris L., Sp. Pl. 867 (1753).

Introduced at Dawson, Macoun, Can, No. 78977.

Senecio yukonensis Porsild in Can. Field-Nat. **64** : 44 (1950).

(Plates IX A and XXXVII, figures 1 to 5)

Perennial with a short, ascending rhizome producing numerous sterile rosettes. Basal leaves numerous, somewhat fleshy, 4 to 6 cm. long, their lower half petiolate with gradually dilated and faintly purplish bases, the blades linear-oblong or oblanceolate, 8 to 10 mm. broad, entire or obscurely repand-denticulate, in youth floccose-lanate beneath, in age becoming glabrate. Flowering stems single or rarely 2 or 3 from each branch of the rhizome, rather stout, 10 to 20 (or rarely 30) cm. high, erect or somewhat flexuous, greenish purple, ribbed, in youth thinly arachnoid-tomentose, glabrate in age, with from 4 to 7 linear, upwards reduced leaves. Heads rarely single, mostly 3 or 4 together, first in a more or less dense cyme, but later the heads become reflexed or even nodding; mature peduncles 2 to 6 cm. long, yellowish woolly. Hypanthium at first densely lanate from moniliform, yellowish hairs; in age becoming glabrous. Phyllaries linear, long-attenuate, dark green or even black, in youth yellowish lanate, in age glabrate. Ligules of the ray flowers lanceolate, about 10 mm. long, pale yellow, 3- to 5-nerved; corollas of the disk flowers yellowish brown, soon concealed by the dirty-white or subrufescent pappus. Achenes 3 mm. long, strongly ribbed and glabrous.

Pass between Teslin and Nisutlin Rivers, mossy alpine summit of mountain east of Mile 14, Nos. 11017 and 11055; same place, M. P. and R. T. Porsild, No. 702; alpine slopes east of Rose River, Mile 77, No. 10963; mossy north summit of granite mountain east of upper Rose River, Mile 85-90, elevation 6,000 feet, No. 10187 (Type); alpine slopes west of upper Rose River opposite Mile 95, elevation 6,000 feet, No. 10226; same place, in dry, alpine heath, No. 10580; north shoulder of Mount Sheldon, in alpine mossy heath, elevation 6,000 feet, No. 11096; south shoulder of Mount Sheldon, alpine heath on rocky ledges, elevation 6,000 feet, No. 11638; northwest end of Itsi Range, alpine slopes south of Mile 252, No. 11393; in mossy places on gravelly summit of shale mountain west of upper Macmillan River, Mile 268, elevation 6,000 feet, No. 11376; Macmillan Pass, Yukon-Mackenzie Divide in alpine tundra near Mile 284, No. 11275. Also, mountains north of McQuesten River on dry, grassy summit, 5,700 feet elevation, Christie, No. 101; McQuesten area, Little Klondike River, 5,800 feet elevation, Campbell, No. 696; on east slope of Mackenzie Range, N.W.T., high alpine ridge west of head of Bolstead Creek, Mile 111 E., V. C. Wynne-Edwards, No. 8402. Also from a single collection from Alaska: Eagle Summit, Lepage, No. 25363 (Can).

Senecio yukonensis is a truly alpine species, which apparently is endemic to high mountains in the Pelly and Mackenzie Ranges where it is not uncommon in mossy heath, far above timber-line. Flowering specimens were first noted early in July and fruiting heads a month later. On August 31, in large wintering buds concealed amongst the withered leaves, next year's inflorescences were in far advanced state of development.

Senecio yukonensis probably belongs in the section INTEGERRIMI (Rydb., Rocky Mt. Flora) in which are placed *S. integerrimus* Nutt., *S. Hookeri* T. & G., *S. exalatus* Nutt. and others; but it is probably not closely related to any of these, or to any other North American member of the genus.

Saussurea americana Eat. in Coult. Bot. Gaz. **6** : 283 (1881).

Northern British Columbia, Haines Road, Mile 85, just south of Yukon-British Columbia boundary, Clarke, No. 437.

Although *S. americana* thus far has been recorded only from Oregon, Idaho, and Washington, there can be little doubt that the single specimen in the collection belongs here. It was collected on July 17, 1944, in beginning anthesis and is 70 cm. high, with a strong rhizome and coarse, very leafy stem. It is glabrous throughout except for the arachnoid-tomentose undersurface of the sharply serrate-dentate, somewhat hastate and acuminate leaves that, as in *S. americana*, are densely covered by yellow, translucent glands on the underside. The phyllaries of the young heads are broadly deltoid-ovate, acute, and arranged in 4 to 5 series.

Saussurea angustifolia DC. in Ann. Mus. Hist. Nat. Par. **16** : 199 (1810); Macoun & Holm. in Rept. Can. Arct. Exp. **5** : 23A (1921).

S. alpina var. *angustifolia*, Ostf., Gjöa Exp. 71 (1909).

S. nuda Britt. & Rydb. in Bull. N.Y. Bot. Gard. **2** : 187 (1901), not Ledeb.

S. remotiflora J. M. Macoun in Geol. Surv., Canada, Mem. **67** : 18 (1914).

Rose-Lapie Pass, rocky summit of mountain east of Mile 105, No. 10936; lower Lapie Crossing, alpine slopes south of Mile 132, elevation

5,600 feet, Nos. 9633 and 9957; Lake Kluane, Burwash Landing, alpine slopes 6,000 to 7,000 feet, Clarke, No. 289. Flowering specimens on June 26.

A variable species which, in addition to the rather distinct var. *yukonensis* (*see* this), is represented by at least two ecotypes. One is a dwarf form apparently restricted to high mountains and is the only one seen by us in southeast Yukon. The other is the tall, long-peduncled plant of lowland tundra which is common in Alaska and extends east along the arctic coastal plain to central Keewatin (Herschel Island, Stringer, Can, Nos. 118, 308; Can. Arct. Exp., Nos. 168 and 207). We did not see this form along the Canol Road, but it has been collected a number of times in the Yukon Basin: Dawson District: Hunker Creek, John Macoun, Can, No. 78988; Yukon River, Rink Rapids, idem, Can, No. 78989; Yukon-Alaska Boundary, Ogilvie Mountains, E. & J. Lohbrunner, July 16-27, 1936; 63° 50′ N., 141° W., C. E. Cairnes, Can, No. 93345; Alaska Highway, White River, Anderson, No. 9341.

Saussurea angustifolia, var. **yukonensis** Porsild in Nat. Mus., Canada, Bull. **101** : 28 (1945).

Besides the type locality on the east slope of Mackenzie Mountains, N.W.T., Wynne-Edwards, No. 8403, known so far only from a few stations on high mountains of Yukon: Mayo District, Bostock, No. 135; Dawson Range, idem, No. 281, and Yukon-Alaska Boundary near Yukon River, D. D. Cairnes, No. 85867.

A rather peculiar plant that differs from the species by its very short stem and densely congested heads which are overtopped by the pale green leaves. The phyllaries are distinctly imbricated, in three series, which show that its relationship is with *A. angustifolia* rather than with the Cordilleran *S. densa.*

Cirsium foliosum (Hook.) DC., Prod. **6** : 654 (1837).

Carduus foliosus Hook., Fl. Bor.-Am. **1** : 303 (1833).

Cirsium minganense Vict. in Mem., Roy. Soc., Canada, Ser. 3, **19** : 81, tab. 1-3 (1925).

In natural prairies on alluvial flats west of Nisutlin River, Mile 36, No. 10876; Rose River, Mile 77, in willow thicket by a pond, No. 10336; Ross Valley in meadows by north end of Sheldon Lake, Mile 222, No. 11582; northeast spur of Mount Sheldon, in subalpine meadows or prairies near Mile 226, elevation 3,400 feet, No. 11493.

Rare and very localized in southeast Yukon and apparently narrowly restricted to relic prairie where it grows in deep, rich loamy soil, associated with *Delphinium glaucum, Arnica Chamissonis, Mertensia paniculata, Ranunculus Macounii, Artemisia Tilesii* var. *elatior,* and others. In the rich prairie meadows on Mount Sheldon it grew 2 to 3 feet tall and had expanded fruiting heads on August 4.

Until full maturity, the heads remain tightly enclosed by the upper stem leaves that at this stage overtop the inflorescence. Fructification may thus take place parthenogenetically as the heads, although they had not opened before collection, produced abundance of mature fruits during the process of drying in the presses.

A careful comparison of our southeast Yukon plant with a representative series of *C. minganense,* including the isotype, fails to disclose any consistent difference. Victorin compared *C. minganense* with *C. foliosum* of the Rocky Mountains and, l.c., p. 83, tabulated several minor differences such as the colour of the corolla, the pappus, and the achene; none of these differences, however, are apparent when *C. minganense* is compared with the fresh Yukon material of *C. foliosum,* and the writer is, accordingly, forced to consider *C. minganense* synonymous with *C. foliosum* even though the Mingan Island population is separated from that of Rocky Mountains by 2,000 miles. In the National Herbarium, *C. foliosum* is further represented by a few collections each from Banff and Jasper Park and by a single collection from Wood Buffalo Park, Alberta (Raup, No. 3422), distributed as *C. Drummondii,* a species of which Raup secured typical material as well (Raup, No. 3421).

Taraxacum

The genus is rather poorly represented in southeast Yukon where only one species, *T. alaskanum,* is common although narrowly restricted to the alpine zone. Otherwise, native dandelions were not prominent in any plant association but occurred more or less sporadically, often as single individuals or in small colonies.

Taraxacum alaskanum Rydb. in Bull. Torr. Bot. Cl. **28** : 512 (1901); Porsild in Sargentia **4** : 77 (1943).

Pass between Teslin and Nisutlin Rivers, alpine slopes near summit east of Mile 14, No. 11018; upper slopes of granite mountain east of Rose River, Mile 85-90, No. 10196; alpine valley west of Rose River, Mile 95, on snowflushes and by alpine brooks, No. 10233; same place, in rich herbmats among willows, No. 11945; west slope of granite mountain east of Mile 95, No. 10529; Rose-Lapie Pass, in a ravine near summit of mountain east of Mile 105, No. 10938; south shoulder of Mount Sheldon, grassy ridges above timber-line, No. 11648; same place, on rocky ledges at summit, elevation 7,200 feet, No. 11757. Also noted in Macmillan Pass. Also from Mayo District, Black Ram to Hot Springs, Bostock, No. 233; Plateau of Kalzas Twin Peaks, idem, No. 146; Dawson Range, 62° 37′ N., 138° 30′ W., idem, No. 283; north fork of Klondike River, Cockfield, No. 70.

A very pretty, little, and apparently clear-cut species which is characteristic of, but never abundant on, moist alpine slopes, fresh moraines, and snowflushes. On Mount Sheldon it ascends to 7,200 feet.

Apparently widespread on high mountains of Alaska and Yukon, east to the Mackenzie Delta, and recently collected on high mountains of the Canadian Rockies, near Banff (Porsild).

Taraxacum dumetorum Greene in Pitt. **4** : 230 (1901); Hagl. in Sv. Bot. Tidsk. **42** : 303 (1948).

Open, wet places in flood-plain spruce forest west of Nisutlin River, Mile 36, No. 10877; same place, in rich poplar wood, No. 10878; Rose River, in pine bog near Mile 77, No. 10335; Rose-Lapie Pass, open, forested slopes of mountain west of Mile 116, No. 10100; Pelly River, shelving banks near Ross trading-post, No. 9698; northeast shoulder of Mount Sheldon, in wooded ravine near 4,500 feet, No. 11104; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11498. Also Ranch Valley, Gorman, No. 1077 (NY), according to Haglund, l.c.

A Cordilleran woodland species which is rare to occasional in open forest and in grassland. It flowers early, and mature heads were noted on July 3.

Taraxacum flavovirens Hagl. in Sv. Bot. Tidsk. **42** : 305 (1948).

Whitehorse, Anderson, No. 1944 (NY), according to Haglund. The type, according to Haglund, l.c., came from Spence's Bridge, B.C., J. M. Macoun, Can, No. 15130.

Taraxacum lacerum Greene in Pitt. **4** : 230 (1901); Haglund, Sv. Bot. Tidsk. **42** : 309 (1948).

T. mutilum Greene, ibid., **4** : 233 (1901).

T. groenlandicum Dahlst. in Arkiv. f. Bot. **9** : 23, tab. 14-15 (1906).

T. ceratophorum Macoun & Holm. Rept. Can. Arct. Exp. **5** : 23A (1921), not DC. *See* Fern. Rhod. **35** : 378 (1933).

Whitehorse, river-banks and roadsides, No. 9236; Rose-Lapie Pass, dry, gravelly slope near Mile 116, No. 10099; Pelly River valley, dry hillside in open aspen woods, Mile 136, No. 9788. Also from Arctic Coast, Herschel Island, Can. Arct. Exp., No. 233.

Taraxacum latilimbatum Hagl. in Sv. Bot. Tidsk. **42** : 312 (1948).

Black Hill Creek, July 15-20, 1898, F. Anderson (type, S.) according to Haglund, l.c.

Taraxacum ovinum Hagl. in Sv. Bot. Tidsk **42** : 317 (1948).

Ranch Valley, Gorman No. 1077 (in part, NY). Also Sheep Mountain, Waterton Lakes Park, Alta, J. M. Macoun, Can, No. 11711 (type, in part) according to Haglund, l.c.

Taraxacum pellianum Porsild in Can. Field-Nat. **64** : 44 (1950).
(Plate XXXVIII, figures 1 to 7)

A small species of the section CERATOPHORA Dahlst. The primary root vertical, thick, many-headed, bearing from 2 to 3 flowering scapes besides small, sterile rosettes. Leaves glabrous, firm, bright green, excepting the purplish median vein, tapering into a narrow petiole; the early leaves 2·5 to 3·0 cm. long, lanceolate, subentire, the fully mature 6 to 8 cm. long and 8 to 10 mm. wide; the lower part of the blade with more or less dentate, runcinate or even hamate margins, the upper third subentire and gradually tapering toward the tip. Scapes 8 to 10 cm. high, erect, at first purplish, later yellowish green, glabrous except just below the heads. Involucrum about 15 mm. high, olive green; the tips of the phyllaries distinctly corniculate. Flowering heads but slightly expanded, about 25 mm. broad, the flowers bright golden yellow, anthers dark yellow, containing pollen. Almost mature achenes 4·24 mm. long, dark straw-coloured, with prominently spiny tips, the pyramid 0·75 mm., and the beak 4·5 mm. long.

Rose-Lapie Pass, rocky ledges on mountain west of Mile 116, Nos. 10101 and 10155; lower Lapie River, dry, shaly slopes of mountain west of

Mile 132, elevation 5,000 feet, flowering specimens on June 20, No. 9760 (Type); same place, rocky ledges in a ravine, No. 9498; rocky summit west of Mile 132, elevation 5,000 feet, No. 9956; Also McQuesten area: Pelly River flats near Pelly farm, Campbell, No. 74.

Taraxacum pellianum, although undoubtedly distinct, is perhaps most closely related to *T. hyperboreum* Dahlst., the type of which came from King William Island, N.W.T. It grows in small tufts bearing numerous erect rosette leaves and usually only one scape; the tap-root is stout for a plant of its size, and its crown is densely covered by the remains of last year's leaves. The young leaves are mostly entire and narrow. It appears to be restricted to sunny, calcareous slopes of the Pelly Range where it flowered from June 15.

Taraxacum phymatocarpum J. Vahl, Fl. Dan., tab. 2298 (1840).

T. eurylepium Dahlst. in Ostf. Gjöa Exp. 72 (1909), tab. 3, fig. 19; Haglund in Sv. Bot. Tidsk. **4** : 343 (1946); idem, ibid., **42** : 304 (1948).

Arctic Coast, Herschel Island, Gjöa Exp. (C).

Haglund, l.c., has upheld *T. eurylepium* Dahlst., although the isotype in Copenhagen, from Herschel Island, by Dahlstedt himself was reduced to the widely ranging, high-arctic *T. phymatocarpum.*

Taraxacum vagans Hagl. in Sv. Bot. Tidskr. **42** : 332 (1948).

Whitehorse, river-banks and roadsides, Nos. 9233, 9234, 9235, and 10638; Pelly River, shelving river-banks near Ross trading-post, No. 9697.

This is the common dandelion around inhabited places. With its deeply runcinate leaves, strongly reflexed, obscurely corniculate outer phyllaries and tawny red achenes, it differs strikingly from all native species seen.

Agoseris aurantiaca (Hook.) Greene in Pitt. **2** : 177 (1891).

Troximon aurantiacum Hook., Fl. Bor.-Am. **1** : 300, tab. 104 (1834).

Pass between Teslin and Nisutlin Rivers, rare in subalpine meadow near Mile 14, elevation 5,000 feet, No. 11019; upper Rose River, in flood-plain meadows near Mile 95, Nos. 10425 and 10426; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, Nos. 11496 and 11497; saddle between Mount Sheldon and Mount Riddell, in subalpine meadows, elevation 4,500 feet, No. 11691. Noted also on the south fork of Macmillan River in natural prairies near Mile 250.

The genus *Agoseris* is badly in need of revision, and few of the numerous species described from the west are well understood. Three "species" were tentatively recognized in the field and were distinguished primarily on differences in the shape, colour, and arrangement of the involucral bracts. As the season advanced, these "differences" became less and less evident. Following a careful examination and comparison in the herbarium, the writer considers all our Yukon material seen by him to belong in one somewhat variable species which, on the whole, closely matches the description and the somewhat stylized plate of *Troximon aurantiacum* Hook., which was based on material collected by Drummond in "alpine prairies of the Rocky Mts.".

In Hooker's plate, the involucral bracts are shown in two series of equal length and shape. In our material, the bracts are very variable. Those of the outer series are of unequal length, dark green to purple, more or less lanate or villous; those of the inner series are variable in shape, glabrous, and purple-spotted; the corollas in life are dark orange but flesh-coloured when dry. Pollen production appears to be normal. The achene shown in Hooker's plate is immature and matches young fruits in our material; in fully ripe achenes, the beak is very distinct, about two-thirds as long as the strongly ribbed body, and the rays of the pure-white, distinctly barbellate, but not plumose, pappus are strongly divaricate.

Agoseris aurantiaca is a pronounced Cordilleran species which along the Canol Road is confined to alpine relic prairies where it was generally found associating with *Heracleum lanatum, Aconitum delphinifolium, Valeriana sitchensis, Phleum alpinum, Thalictrum sparsiflorum* var. *Richardsonii*, and others. On mountains east of the Teslin-Nisutlin Pass it ascends to 5,000 feet, and, on Rose River, flowers and abundant mature fruits were noted on July 14. It is new to the flora of Yukon.

Agoseris gracilens (Gray) Ktze., Rev. Gen. **1**: 304 (1831).

Flowering specimens of *A. gracilens* have been collected on the Haines Road just south of the Yukon-British Columbia boundary, Clarke, No. 429.

Crepis elegans Hook., Fl. Bor.-Am. **1** : 297 (1834).

Whitehorse, Anderson, No. 9548; Nisutlin River, on steep clay banks near Mile 36, No. 10875; lower Lapie River, on gravelly river bars near Mile 127, No. 10026. Also from Pelly River, above the canyon, Dawson, Can, No. 14962; Dawson, Malte, No. 61; north fork of Klondike River, Cockfield, No. 67; Klondike River, John Macoun, Can, No. 91088; Alaska-Yukon Boundary, north of Black River, D. D. Cairnes, Can, 81555; Dawson Range, Bostock, Nos. 198 and 282; Kluane Lake, Burwash Landing, Clarke, No. 286; south end of Kluane Lake, Anderson, No. 9362.

A Cordilleran lowland or foothill species which in Yukon appears to be confined largely to calcareous river-flats of the Yukon drainage. *C. elegans* apparently is not common along the Canol Road where it was noted only as stated above. Our specimens flowered on Lapie River on June 27 and on the Nisutlin had almost mature fruits on July 23.

Crepis nana Richards. in Bot. App. Frankl. Journ. 746 (1823).

Rose-Lapie Pass, very scarce on limestone cliffs near Mile 105, No. 10931; lower Lapie Crossing, in shaly slide-rock near summit south of Mile 132, elevation 5,600 feet, No. 9952. Also from Alaska-Yukon Boundary, near Black River, D. D. Cairnes, No. 62.

Apparently a rare arctic-alpine species confined to calcareous slide-rock. At Lapie River, the species flowered at 5,600 feet on June 27.

Hieracium gracile Hook., Fl. Bor.-Am. **2** : 298 (1834).

Pass between Teslin and Nisutlin Rivers, subalpine meadow near Mile 14, No. 11159; alpine slope east of Rose River, Mile 77, No. 11997; upper Rose Valley, granite mountain opposite Mile 85-90, No. 10195; south shoulder of Mount Sheldon, grassy slopes and ridges above timber-line, elevation 5,000 feet, No. 11645. Also Mayo District between Edwards and Nelson Creeks, Bostock, No. 145.

Hieracium gracile is a variable species which is not uncommon in southeast Yukon above timber-line. Specimens collected on mountains in Pelly Range closely match those of the type collection by Drummond "on the more elevated Rocky Mountains" of which there is a duplicate in the National Herbarium of Canada. *H. triste* enters the northern part of our area where intermediate forms between that species and *H. gracile* occur. On Mount Sheldon and on a few other mountains, a tall, very robust form was found which may possibly be of hybrid origin, although it appeared to be fertile and quite common locally; it is described below as var. *yukonense.*

According to Hultén (Fl. Aleut. Isl., pp. 340-1) similar conditions exist in the Aleutian Islands and in southwest Alaska, except that our plant clearly is neither *H. gracile* var. *alaskanum* Zahn nor *H. triste* var. *tristiforme* Zahn.

Hieracium gracile Hook. var. **yukonense** Porsild in Can. Field-Nat. **64**:45 (1950). (Plate XXXIX, figures 1 and 2)

Differs from the species by its more strongly developed root, bearing dense rosettes of rather firm leaves, by its stout, 30 to 40 cm. high and 2 to 3 mm. thick flowering stems bearing 10 to 15 (30) sub-umbellate large heads on long, slender, black-villous peduncles.

South shoulder of Mount Sheldon, in old burns on timbered lower slopes in saddle between Mount Sheldon and Mount Riddell, elevation 4,500 feet, No. 11693 (Type); same place, grassy slopes above timber-line, No. 11646; northeast spur of Mount Sheldon, in subalpine meadows near Mile 226, No. 11499; upper Rose, river-flat meadows near Mile 95, No. 10427.

The var. *yukonense,* by its stout and tall stems, many-headed inflorescence, and large, leafy rosettes, differs strikingly from the low, few-headed *H. gracile.* From *H. triste* it differs by the presence on the peduncles of stalked glands and by the basal leaves which are glabrous, oblanceolate, sharply acuminate, and almost cuspidate rather than obovate-obtuse.

On Mount Sheldon var. *yukonense* fruited abundantly the first week of August. The achenes, as in *H. gracile,* are dark, wine-red, drying almost black.

Hieracium triste Willd. ex Spreng., Syst. Veg. **3** : 640 (1826).

H. gracile sensu Porsild, Nat. Mus., Canada, Bull. **101** : 28 (1945), not Willd.

Pass between Teslin and Nisutlin Rivers, M. P. and R. T. Porsild, No. 703; Rose River, alpine slopes east of Mile 77, No. 10968; timbered lower slope and saddle between Mount Sheldon and Mount Riddell, No. 11692; upper south fork of Macmillan River, on shale mountain west of Mile 268, No. 11378; Macmillan Pass, Mackenzie-Yukon Divide, No. 11267. Also in mountains north of McQuesten River, Christie, No. 102.

A Beringian species previously known from Kamtchatka, the Kuriles and Commander Islands, east along the Aleuts to Alaska Peninsula. The first two numbers have a few stalked glands on the peduncles and more pointed leaves. They are probably *H. triste* x *gracile;* the last two numbers are typical.

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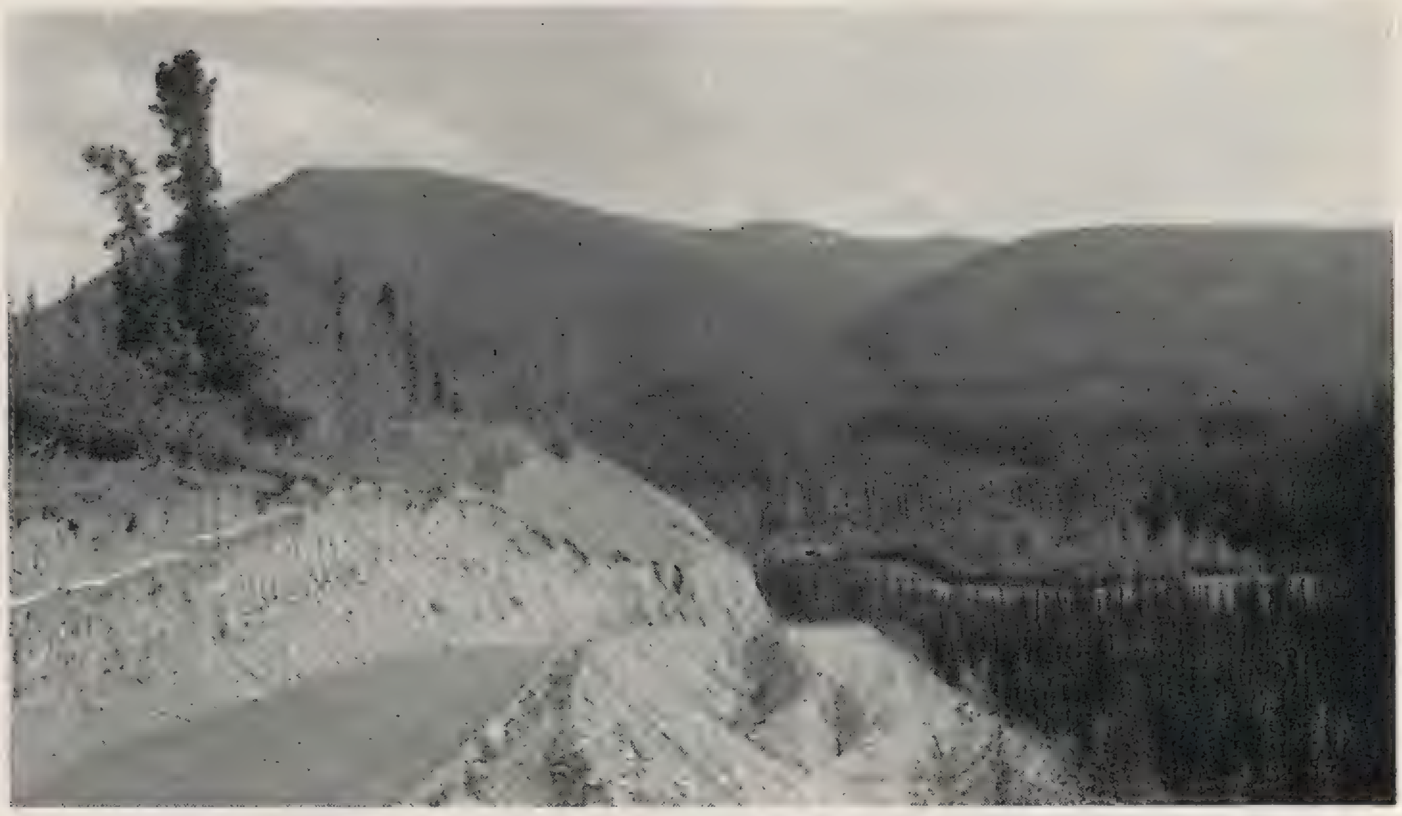
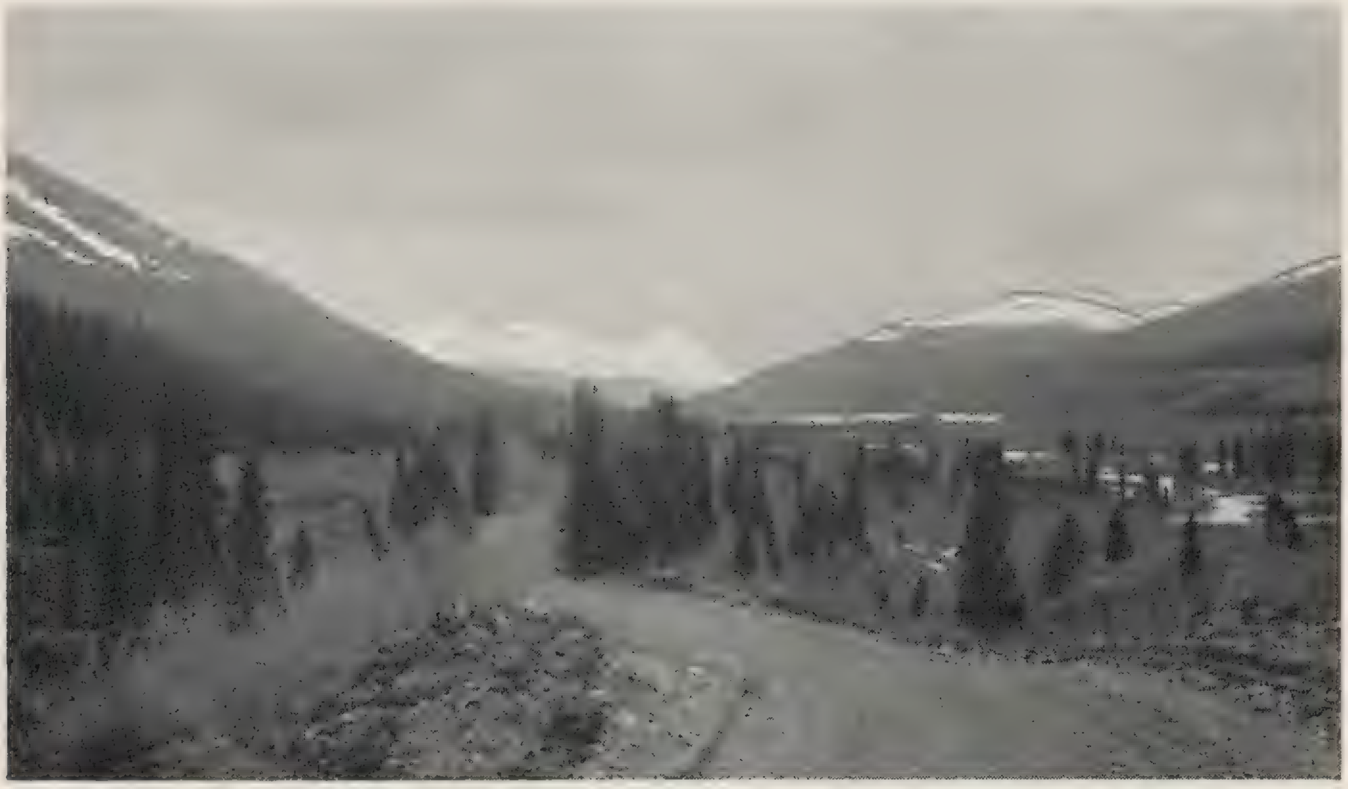
ILLUSTRATIONS: Plates II to XXXIX

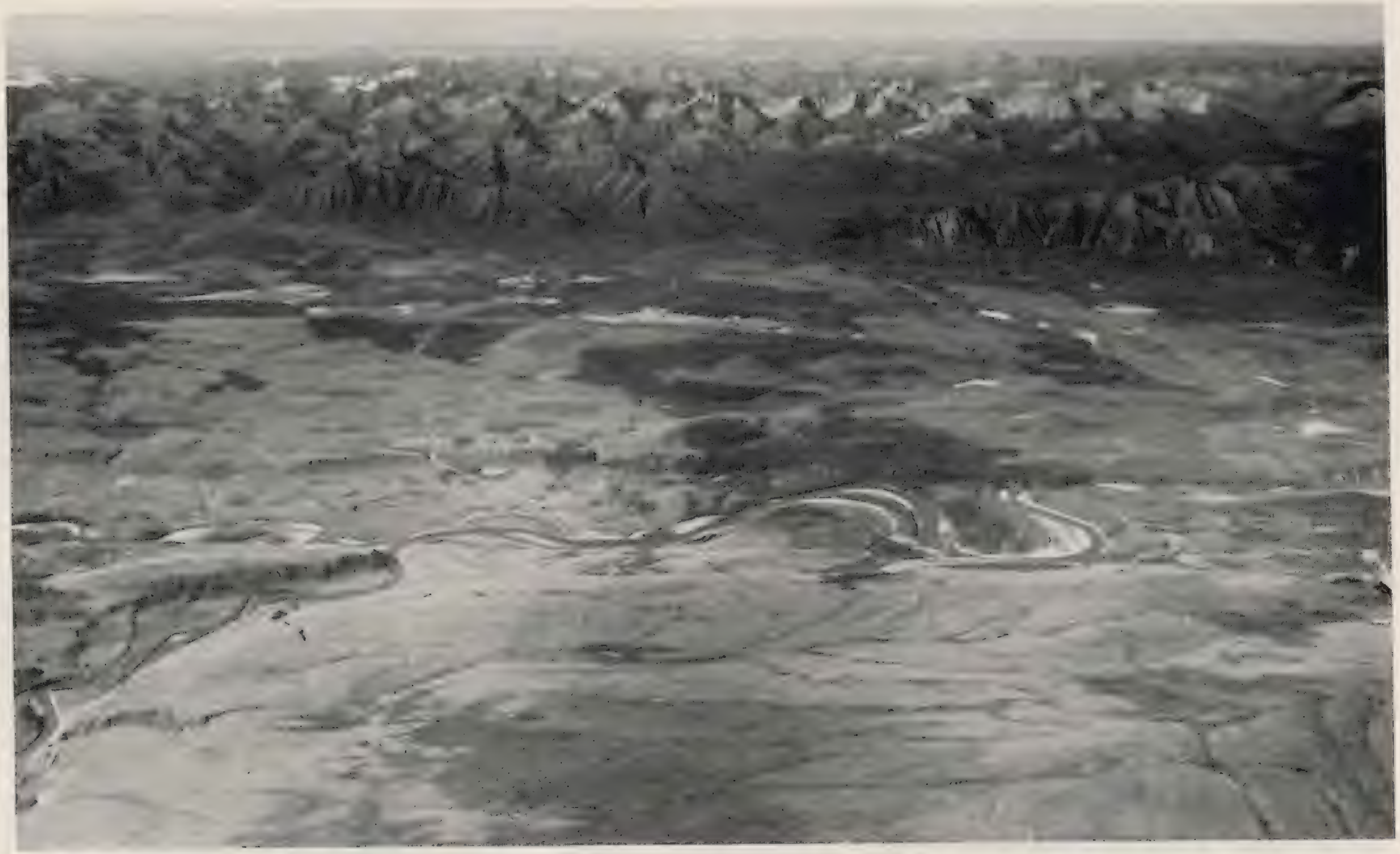


A. View from lower Lapie River crossing showing rounded, unglaciated hills with west slopes forested to 4,250-foot elevation. In left foreground, roadcut showing glacial till capped by windblown soil alternating with beds of peat deposited on top of layer of white volcanic ash.



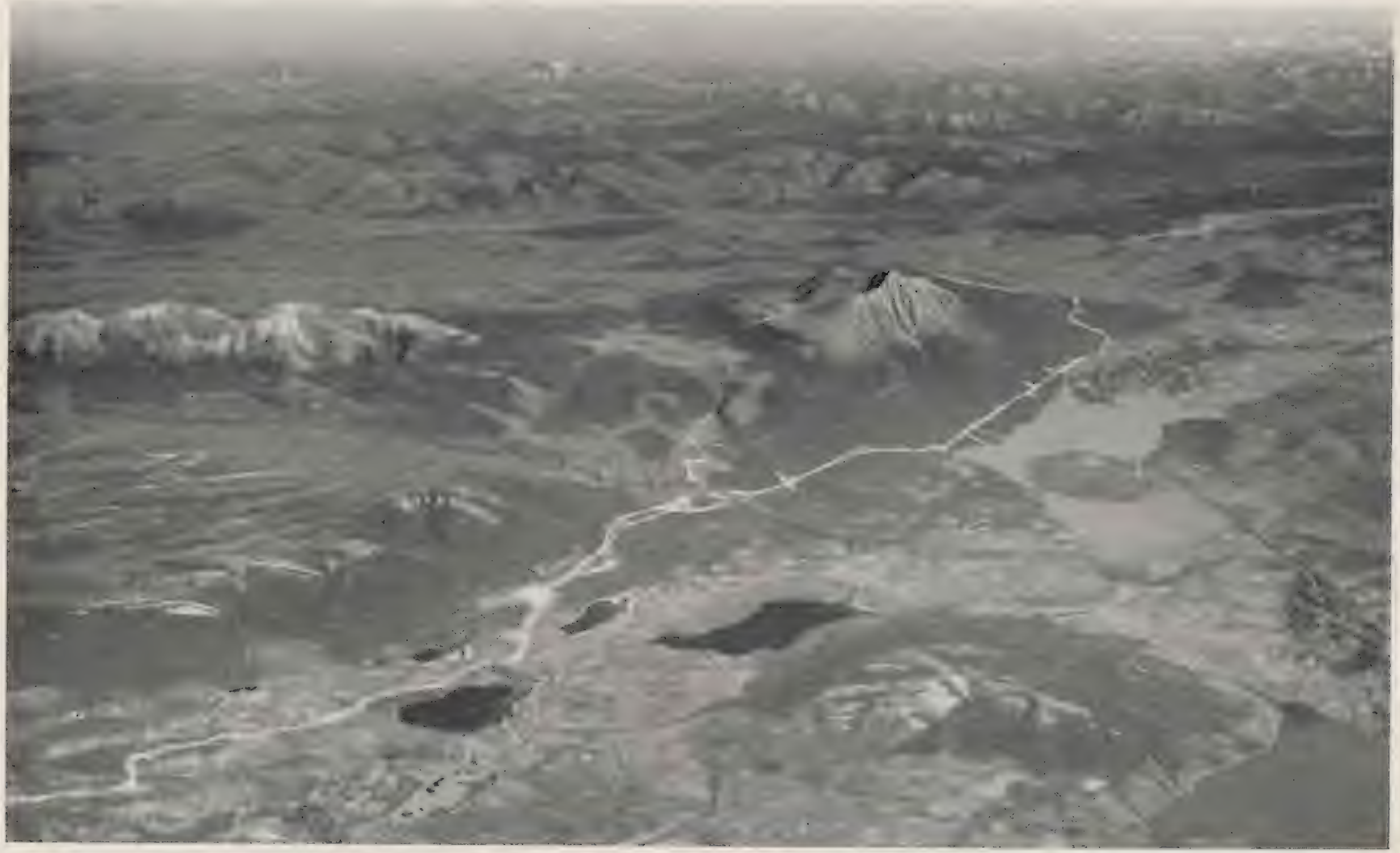
B. Rose-Lapie Pass looking south from Mile 106. In foreground, glacial esker covered by *Betula occidentalis* scrub and scattered *Picea glauca* var. *albertiana*. In centre, Lapie Lake; north and east slopes of hills are still snow-covered toward the end of June.

Plate III

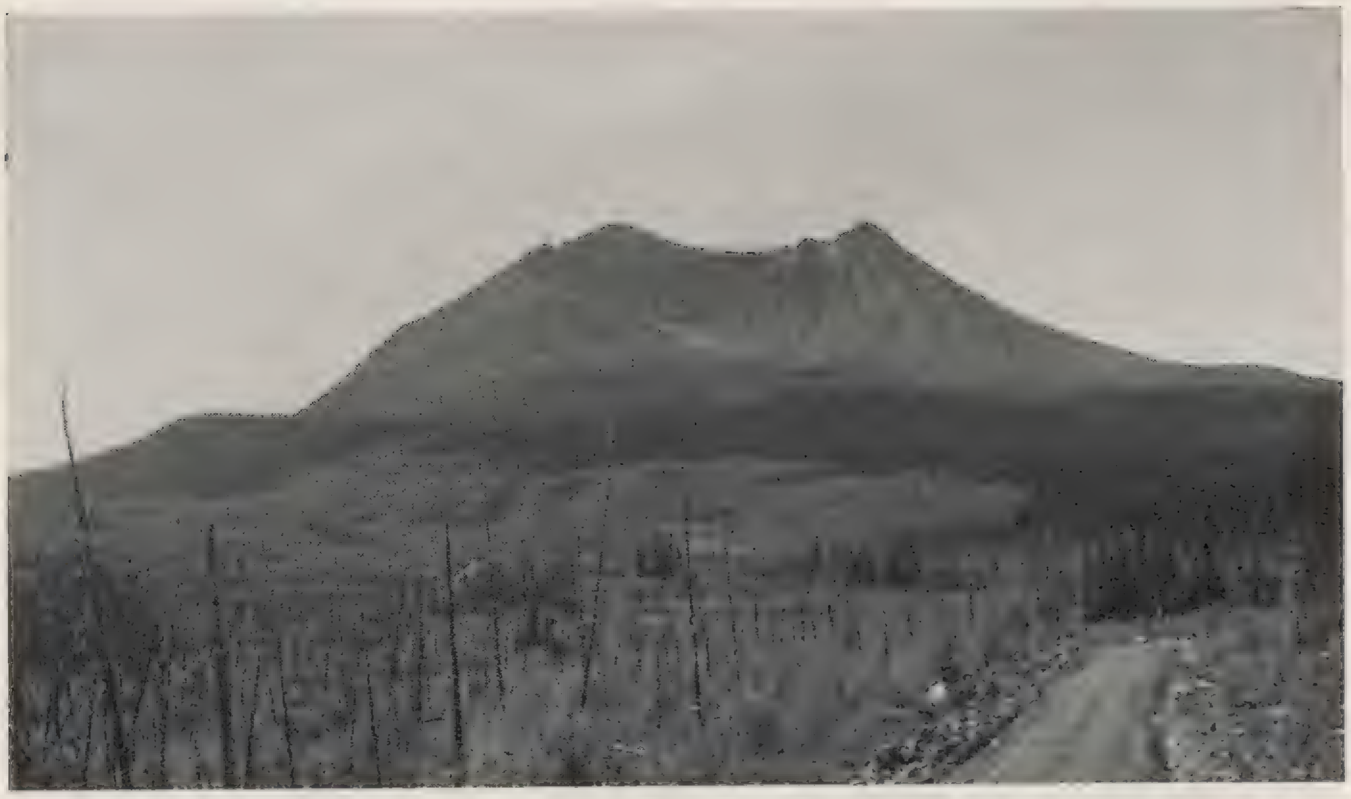


Tintina Valley and St. Cyr Range, Pelly Mountains: view southwest over Ross River Post and across the junction of Ross and Pelly Rivers. Note the wall-like front in which Pelly Mountains rise from Tintina Valley. Lapie River emerges from the Pelly Mountains in centre right to join the Pelly. The Canol Road can be seen in the left centre. Photo by Royal Canadian Air Force; negative T15R-157.

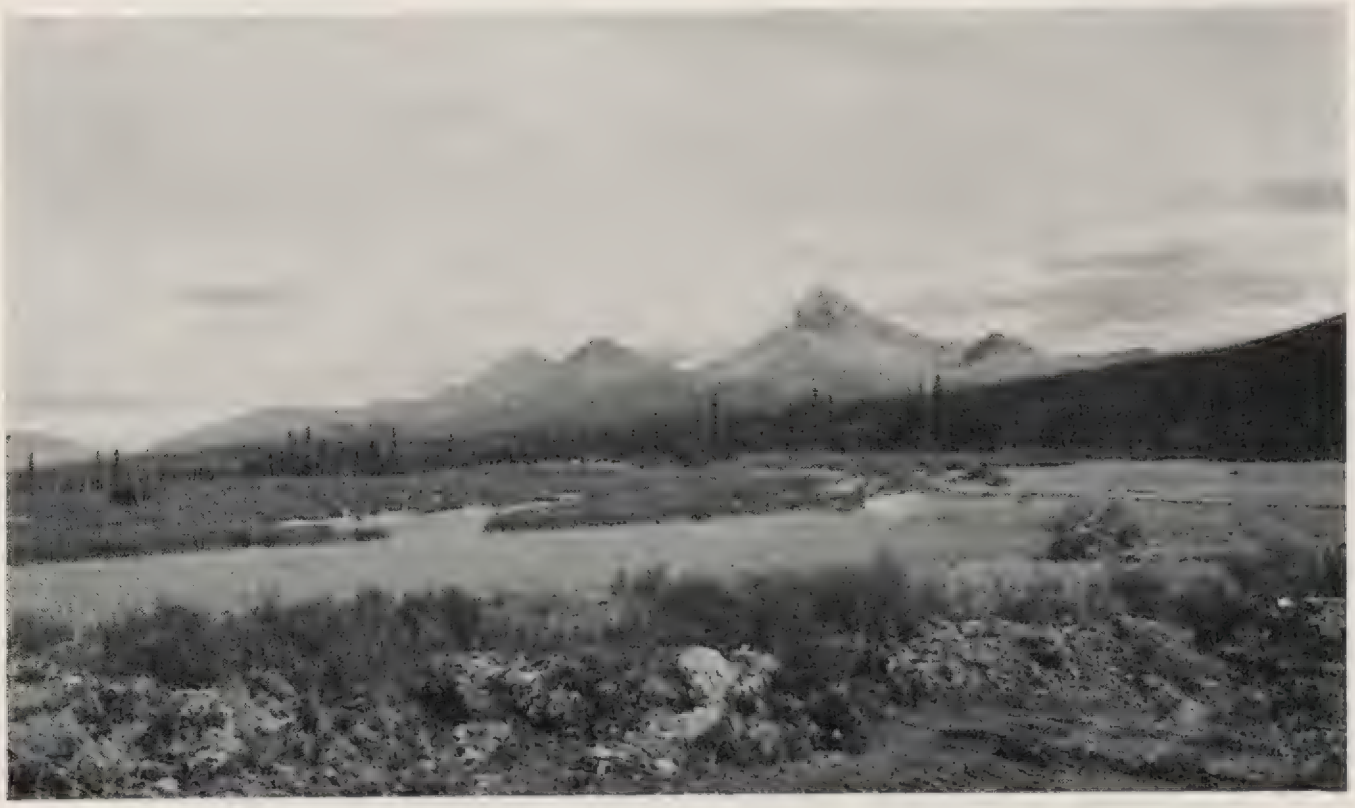
PLATE IV



Hess Mountain and Pelly Plateau: view north over Lewis, Field, and Sheldon Lakes and Mount Sheldon (centre of picture). The Canol Road winds along Ross River valley and disappears as it bends northward to cross to south branch of Macmillan River valley in the middle distance. Photo by Royal Canadian Air Force; negative T9-94 L.



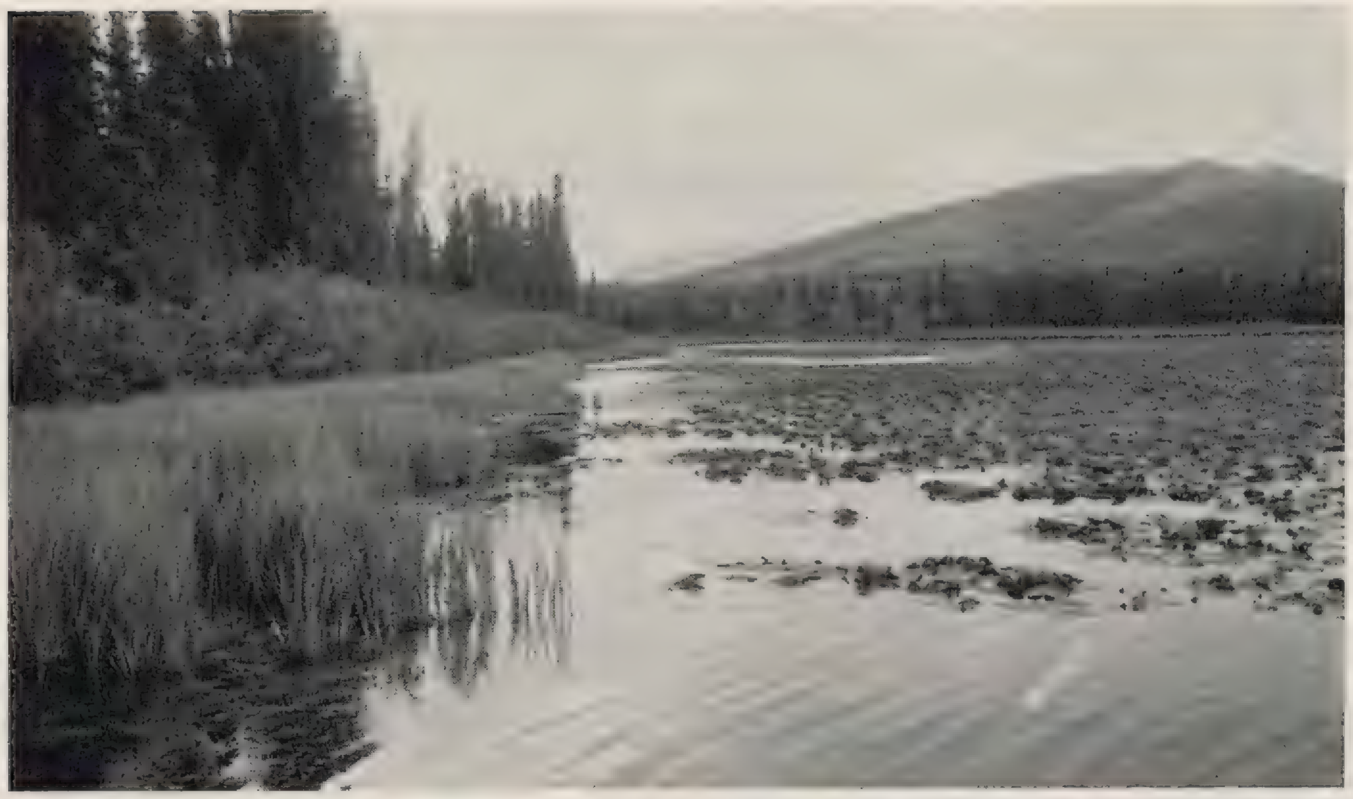
A. Mount Sheldon (7,200 feet) viewed from north showing large glacial cirque surrounded by knife-edged crest. North slope of Mount Sheldon carries a dense stand of white spruce mixed with alpine fir and occasional black spruce (Forest type 3). Timber-line is at 4,500 feet elevation. Left foreground, fire-killed young spruce forest with dense new growth of willow.



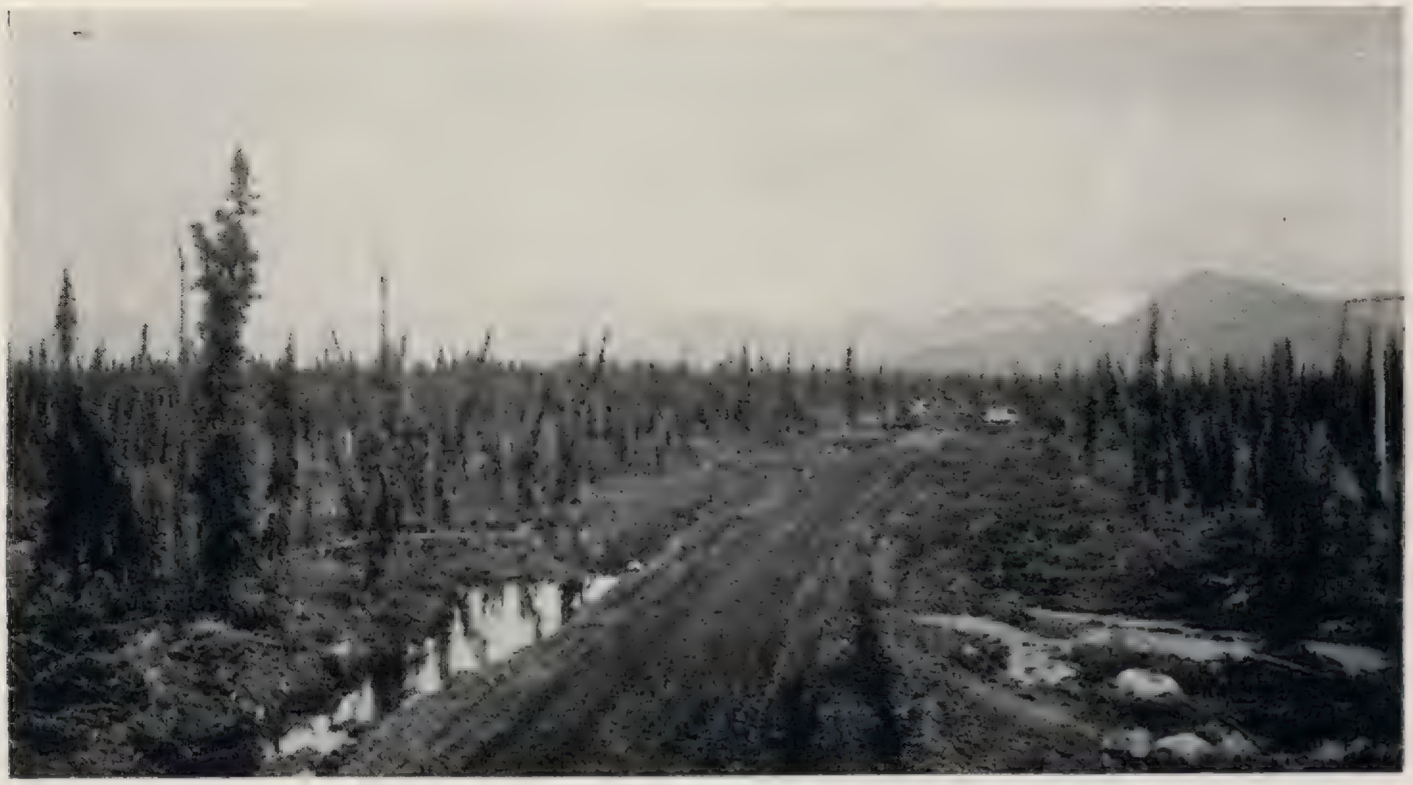
B. River terrace in valley of south branch of Macmillan River near Mile 250. In centre, grassland on rich alluvial soil between glacial eskers covered by *Betula occidentalis* scrub. In background, west spur of Itsi Mountains.

A. Detail of rich grassland near Mile 250 on south branch of Macmillan River. White spruce, on left, grows along small creek. In background, hillside covered by black spruce muskeg.

B. Extensive grassland on rich soil fringed by eskers covered by birch scrub and white spruce. South branch of Macmillan River near Mile 250.



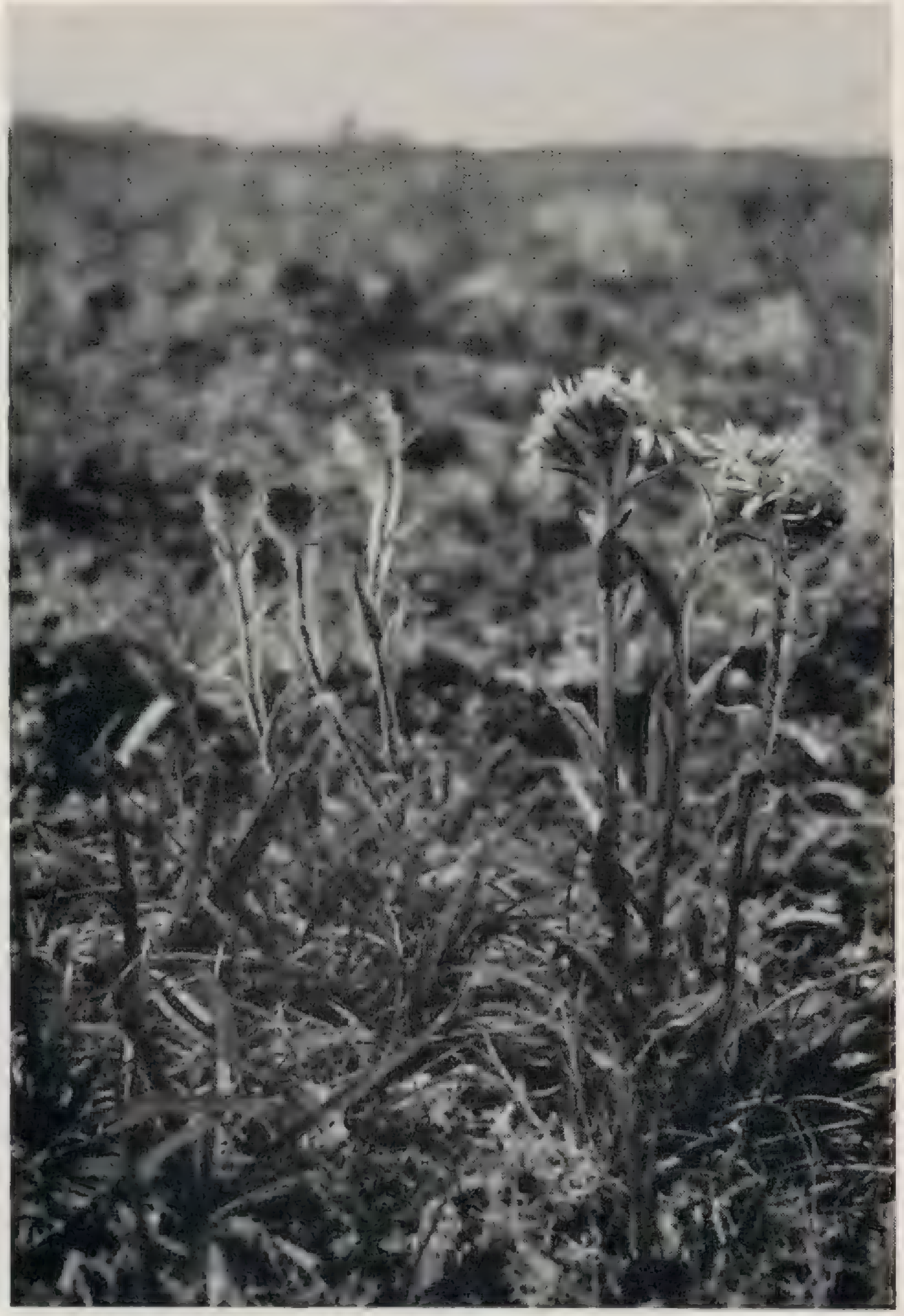
A. Lily-pads (*Nuphar polysepalum*) in John Lake south of Mount Sheldon. By the lake shore a broad belt of *Carex aquatilis* and *C. rostrata*. Along the banks grow *Salix Bebbiana* and *S. arbusculoides*.



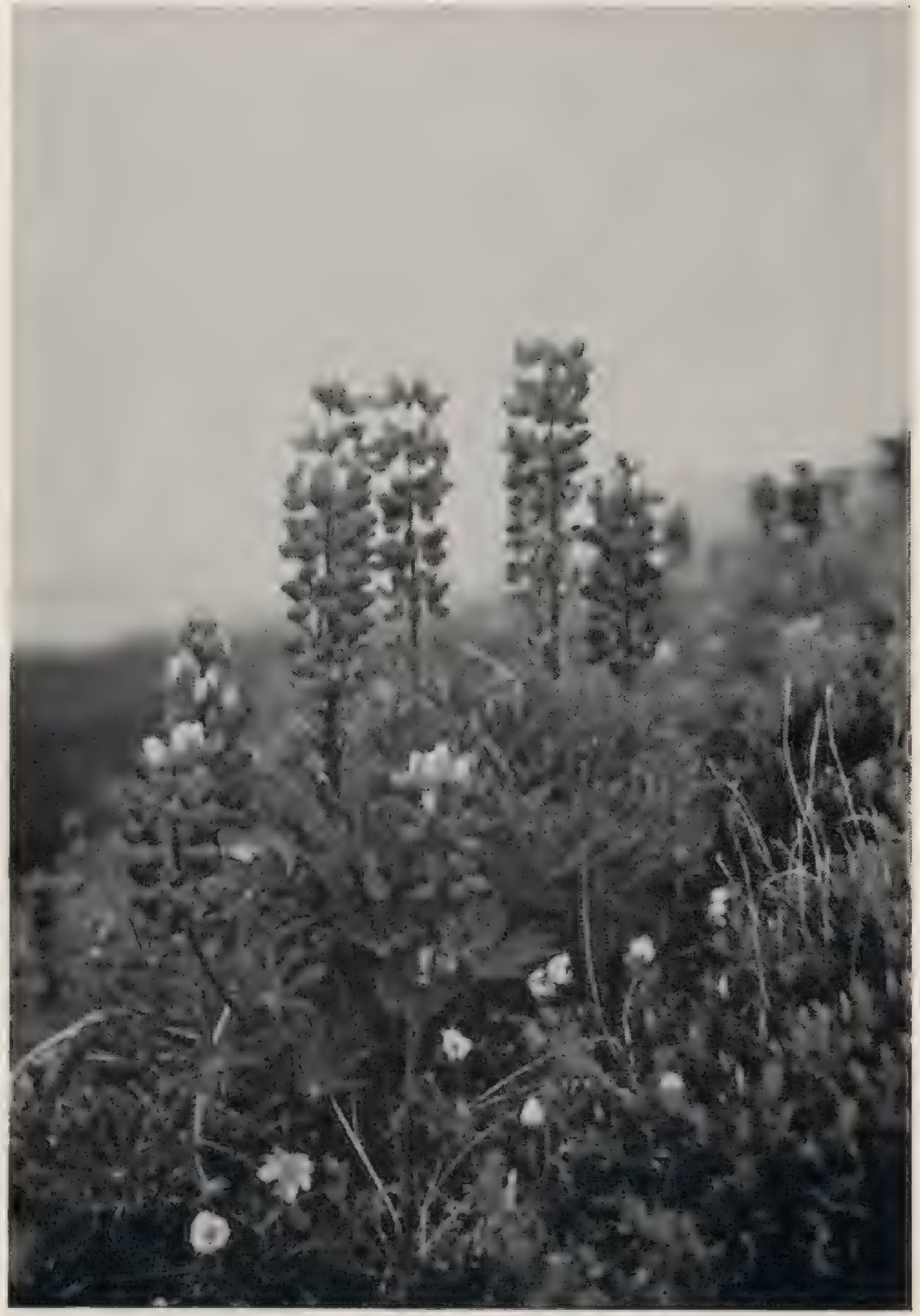
B. Black spruce muskeg on boulder clay in the valley of the south branch of Macmillan River near Mile 262.

A. *Aster alpinus* L. ssp. *Vierhapperi* Onno.

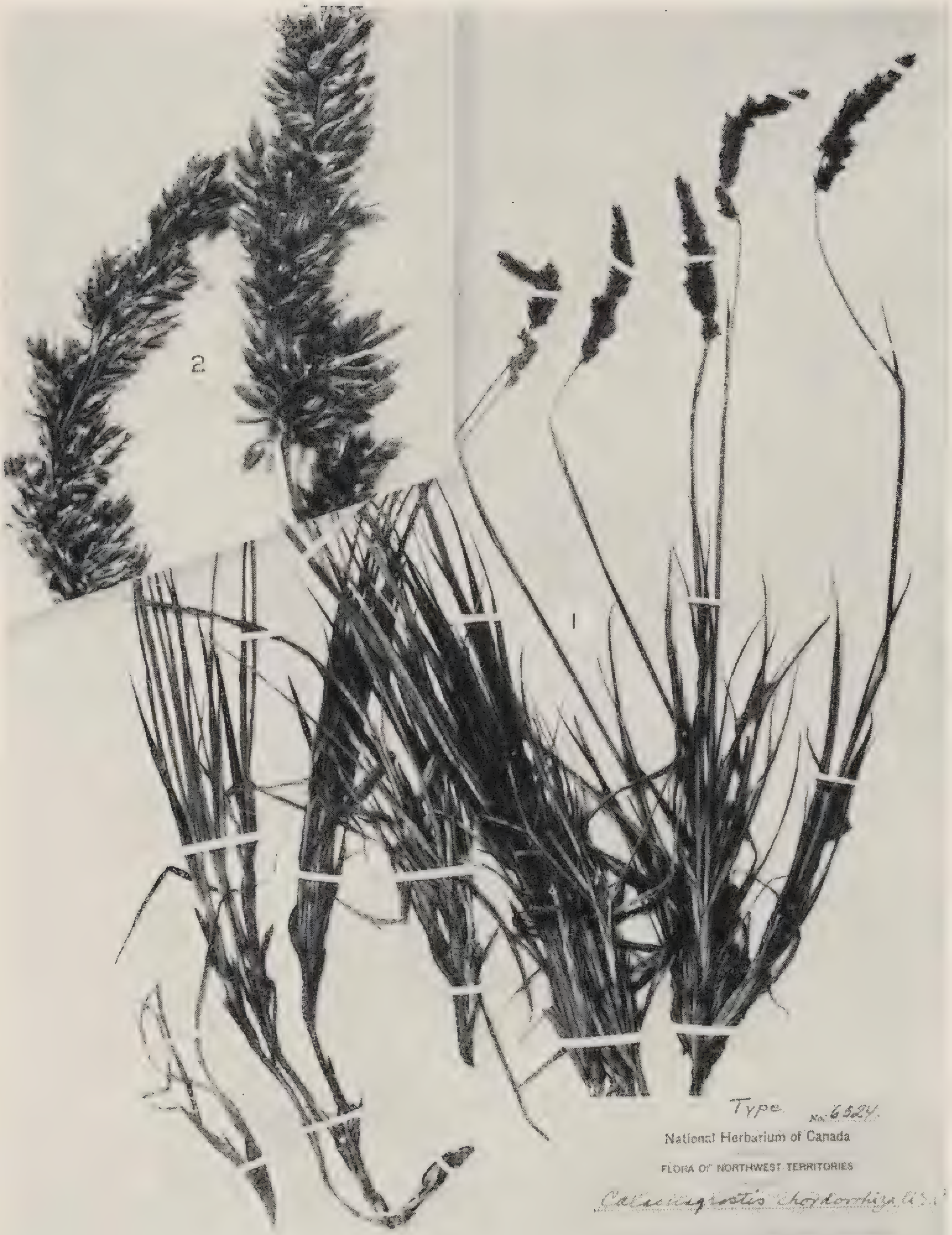
B. *Senecio Kjellmanii* Porsild.



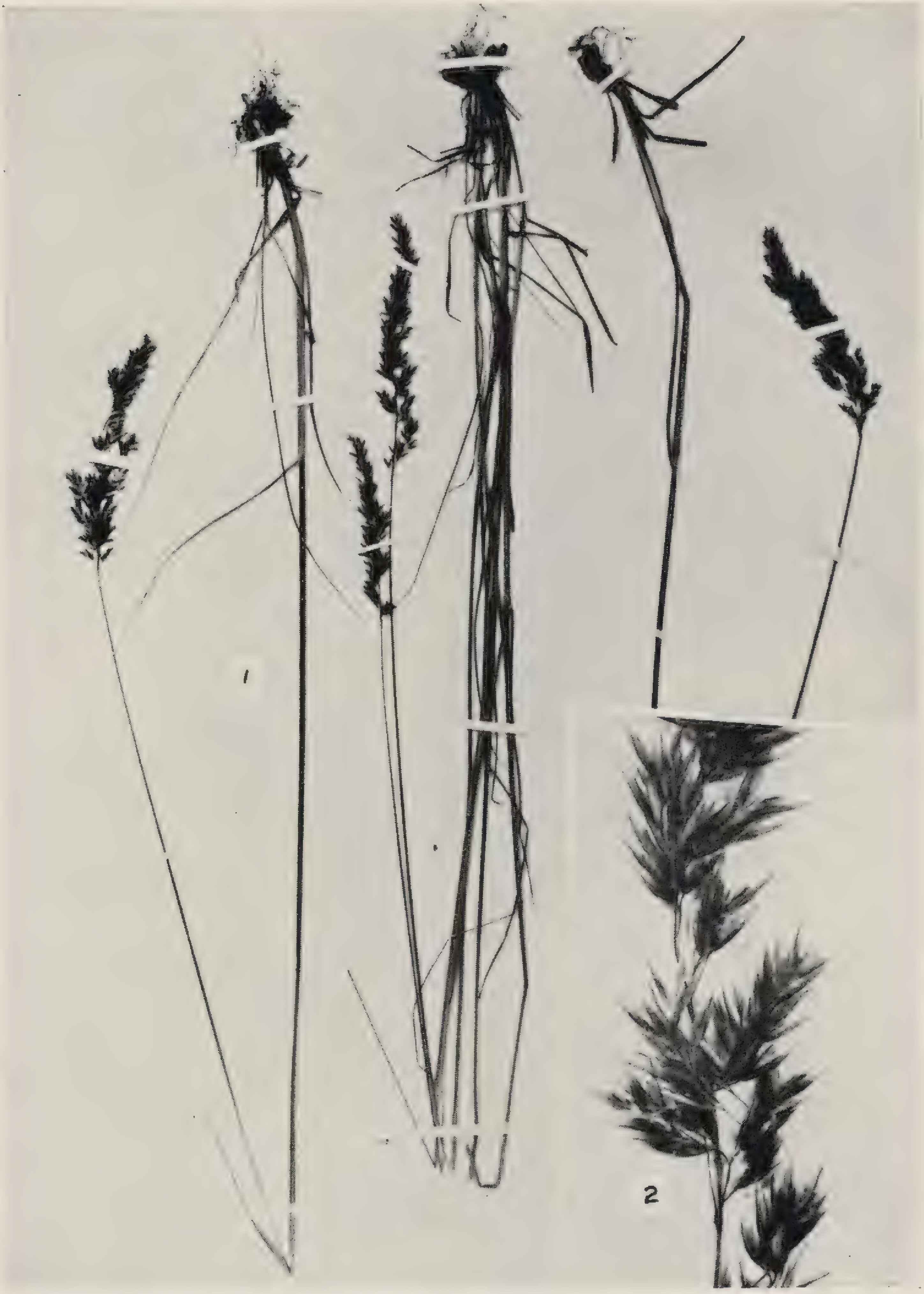
A. *Senecio yukonensis* n.sp.



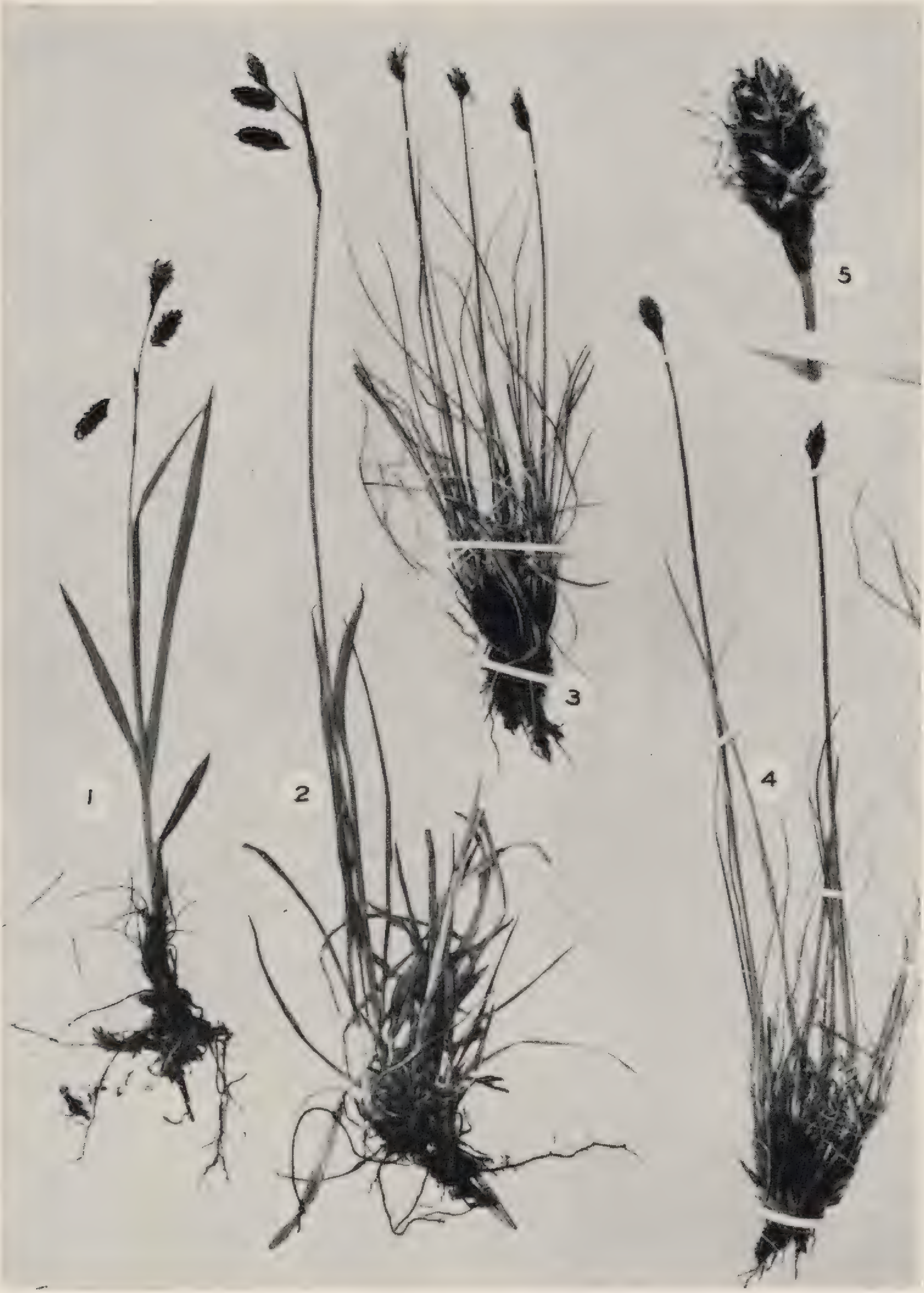
B. *Lupinus arcticus* Wats. In foreground. *Anemone parviflora* Michx. and *Dryas octopetala* L.


2
1
Type No. 6524.
National Herbarium of Canada
FLORA OF NORTHWEST TERRITORIES
Calamagrostis chordorrhiza Ps.
Hab. and Loc., Mackenzie River delta: East branch,
Lat. 68° 40'-~~54'~~ N.
forming large cushions in sandy soil
Collector, A. E. Porsild Aug. 7 1932

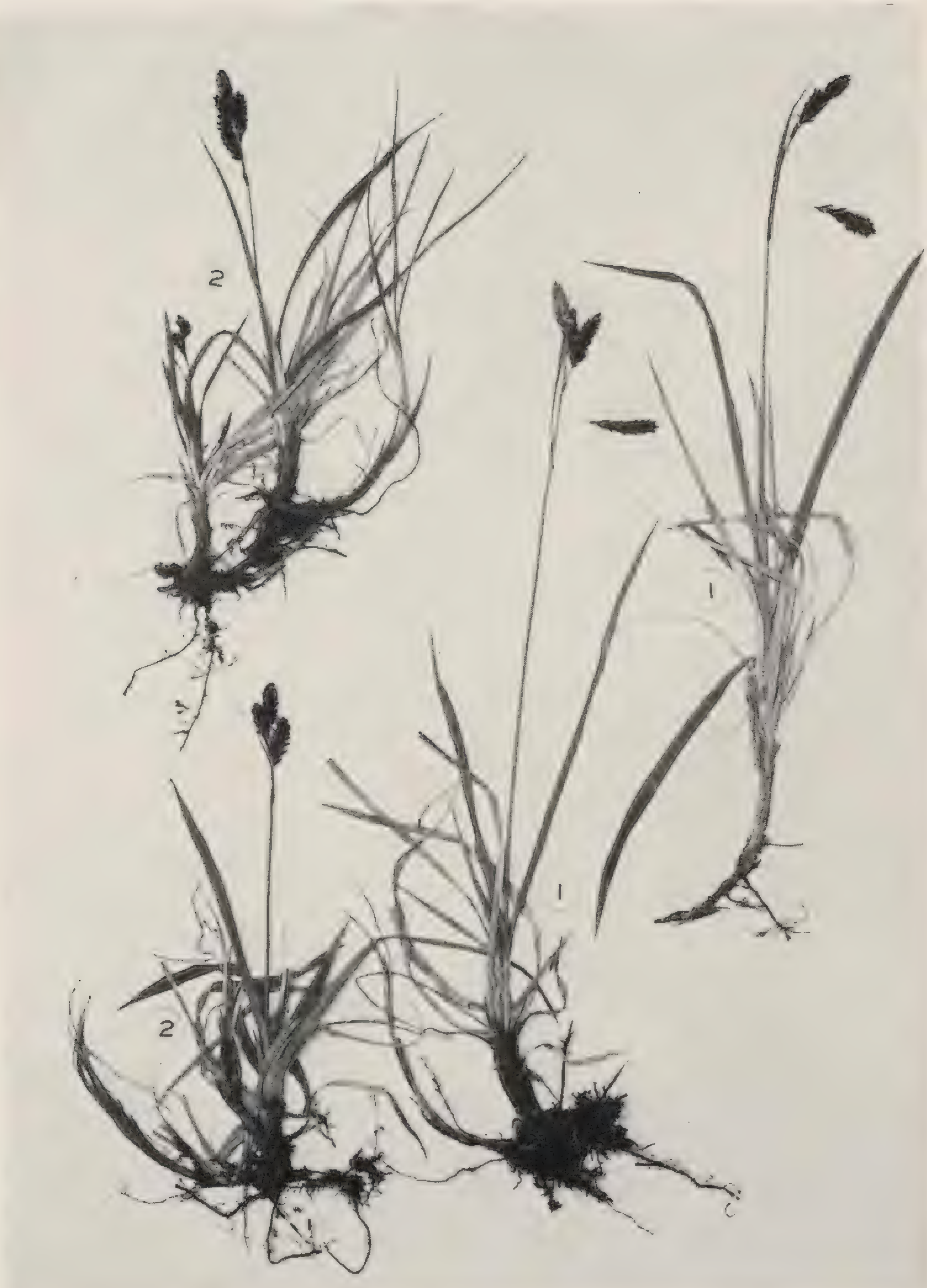
Calamagrostis chordorrhiza Porsild: Figure 1, flowering plants, x 3/7; Figure 2, flowering panicles, x 2; all from Type (Mackenzie Delta, east branch).



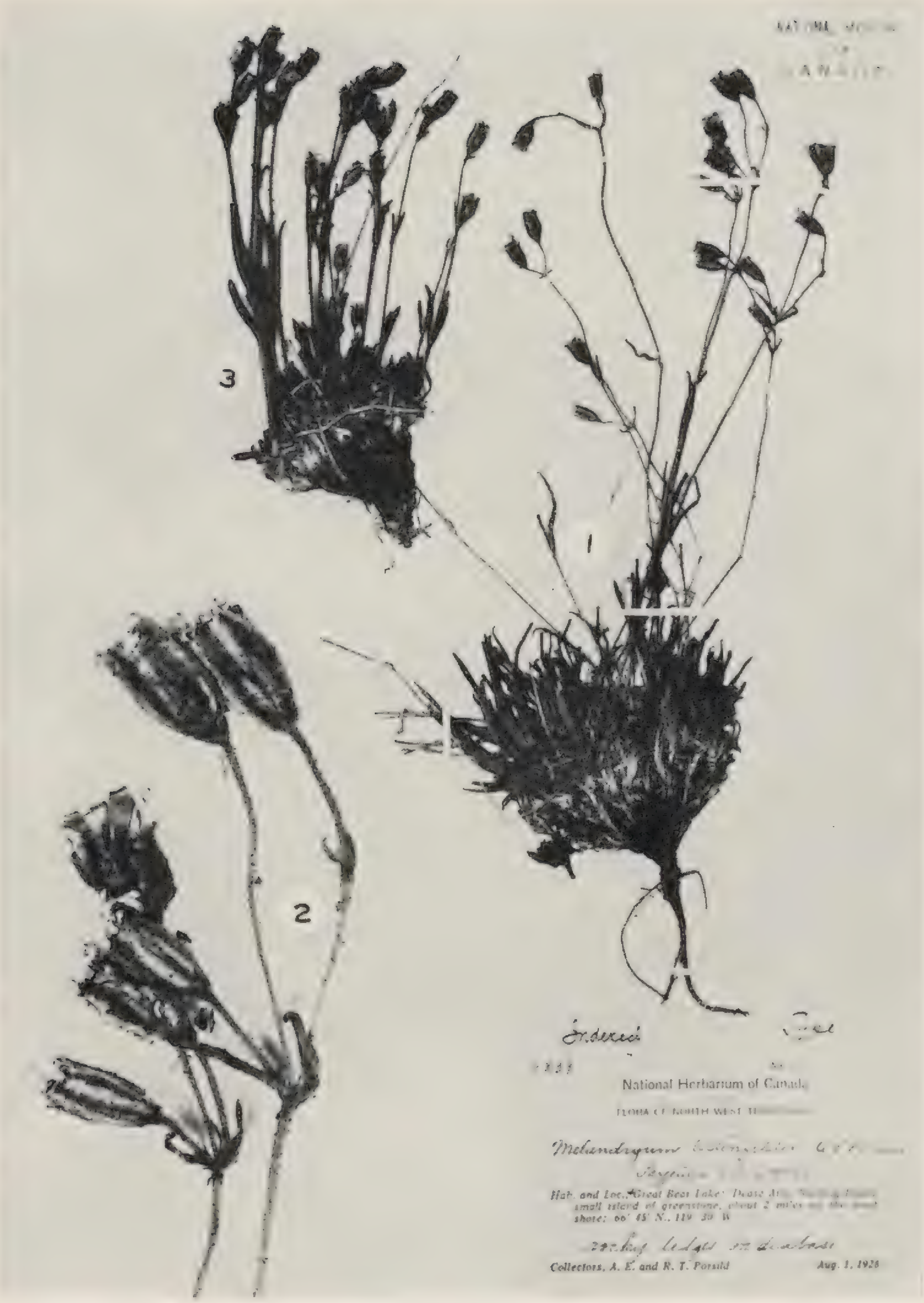
Calamagrostis lapponica (Wahlenb.) Hartm. var. *nearctica* Porsild: Figure 1, fruiting plants, x 3/7; Figure 2, part of fruiting panicle, x 2; all from Type (Mackenzie Delta, east branch).



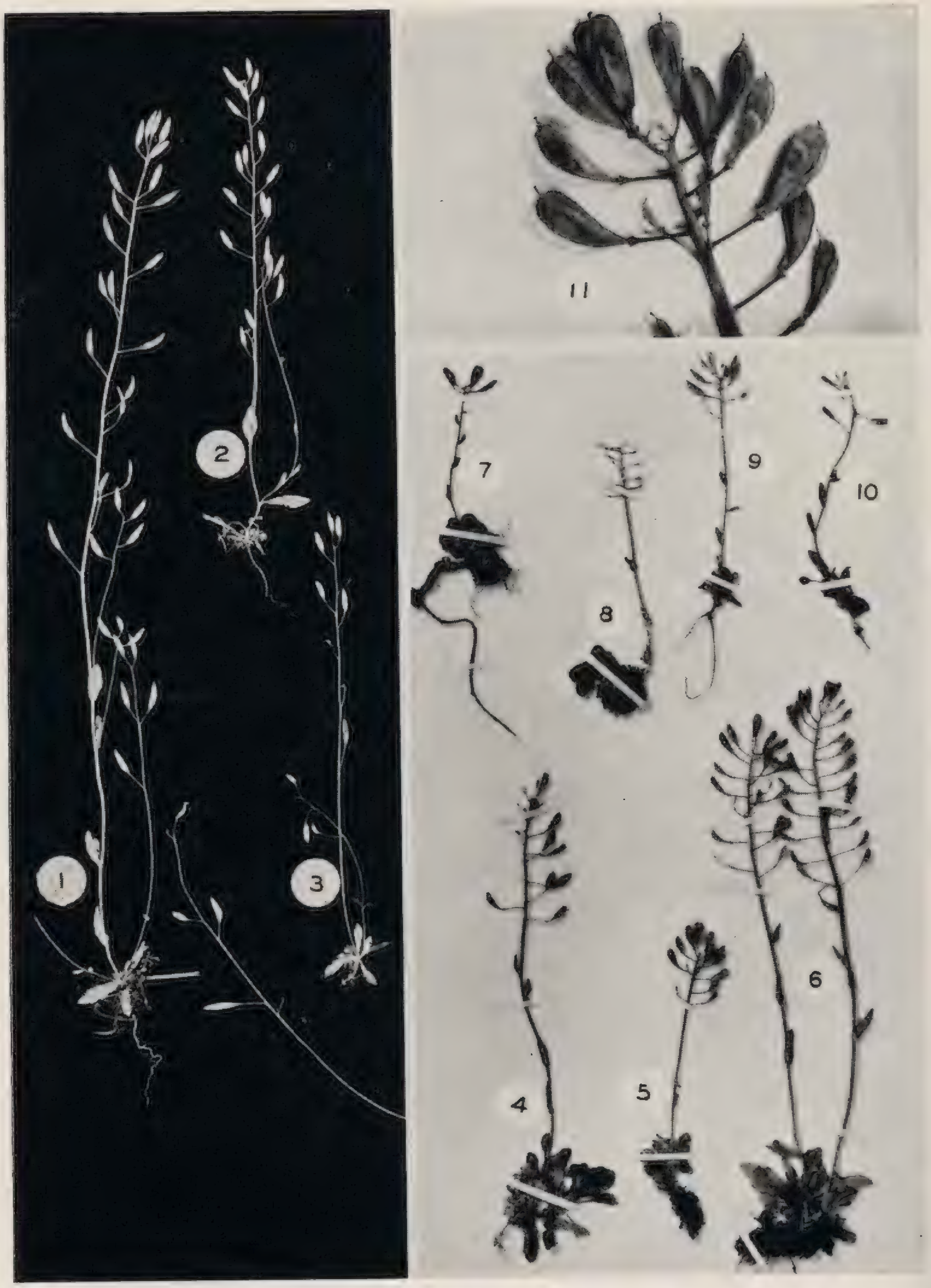
Carex podocarpa R.Br.: Figures 1 and 2, flowering plants, x 1/2, Porsild and Breitung, Nos. 10940 and 10548 (Pelly Mountains, Yukon). *Kobresia hyperborea* nomen nov.: Figures 3 and 4, flowering plants, x 3/7; Figure 5, flowering spike, x 2; all from Type of *Kobresia arctica* Porsild, not *K. arctica* Ivan. (Mackenzie Delta).



Carex microchaeta Holm: Figures 1 and 2, fruiting plants, x 1/2, Porsild and Breitung, Nos. 10546 and 9907 (Pelly Mountains, Yukon).

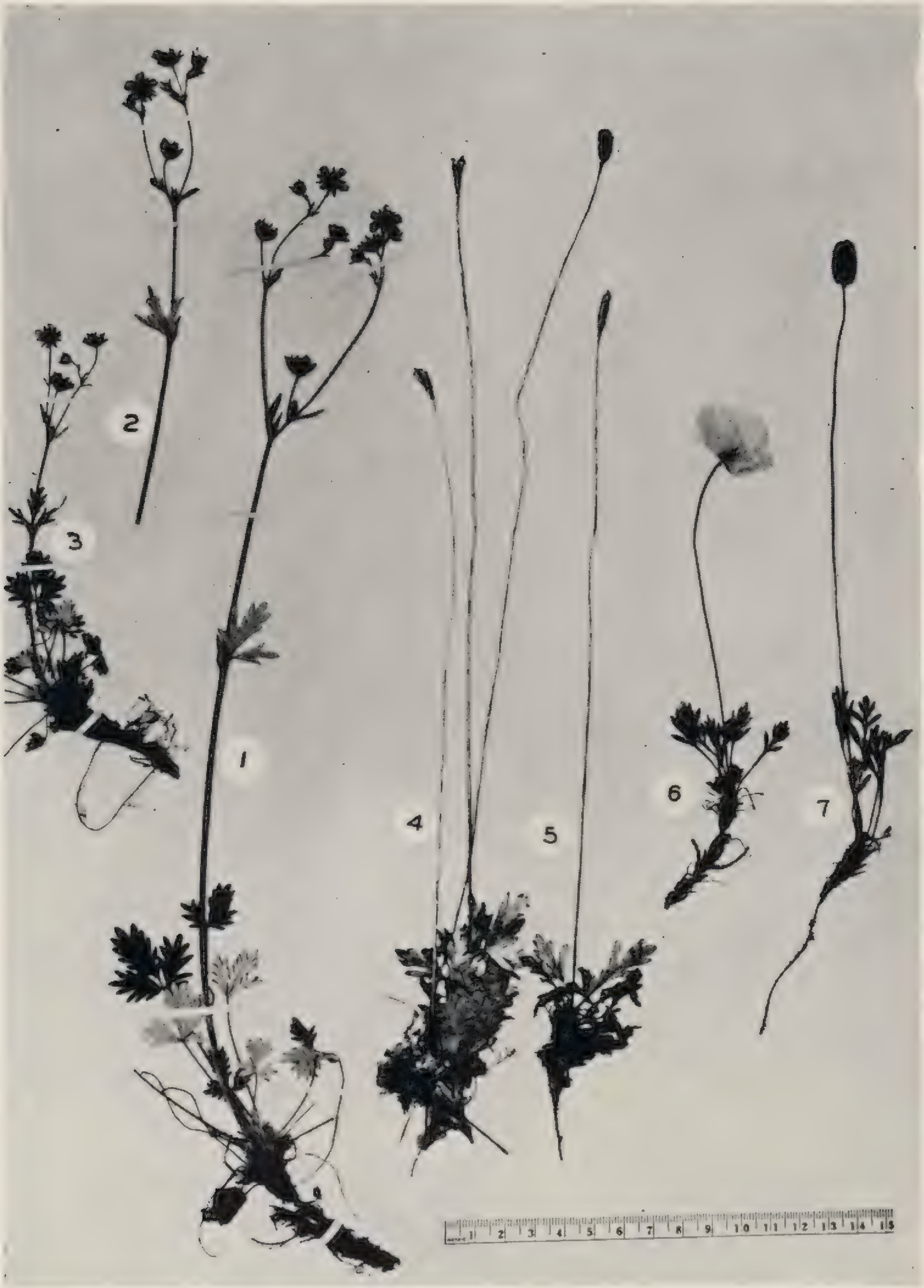

3
1
2
Indexed
National Herbarium of Canad
Collectors, A. E. and R. T. Porsild
Aug. 1, 1928

Melandrium Ostenfeldii Porsild: Figure 1, fruiting plant, x 2/5; Figure 2, fruiting inflorescence, x 3/2; both from Type (Great Bear Lake, N.W.T.); Figure 3, plant with immature fruits, x 2/5; Porsild and Breitung, No. 9438 (Pelly Mountains, Yukon).

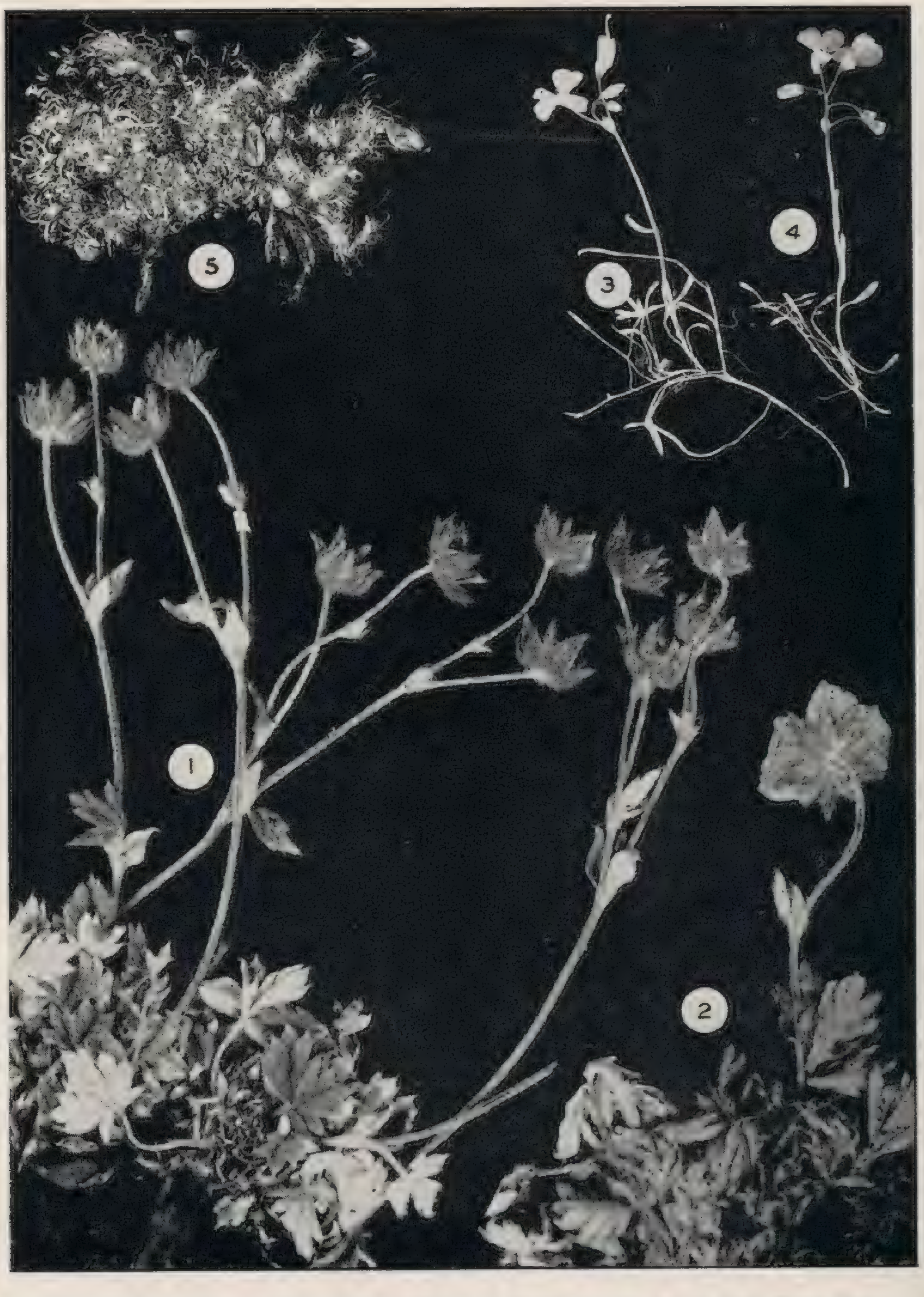


Draba nitida Greene: Figures 1, 2, and 3, fruiting plants, x 3/7, Porsild and Breitung, No. 11475 (Mount Sheldon, Yukon). *Thlaspi arcticum* Porsild; Figures 4, 5, 6, 7, 8, 9, and 10, fruiting plants, x 3/7; Figure 11, fruiting raceme, x 2; all from Type (Arctic coast of Yukon).

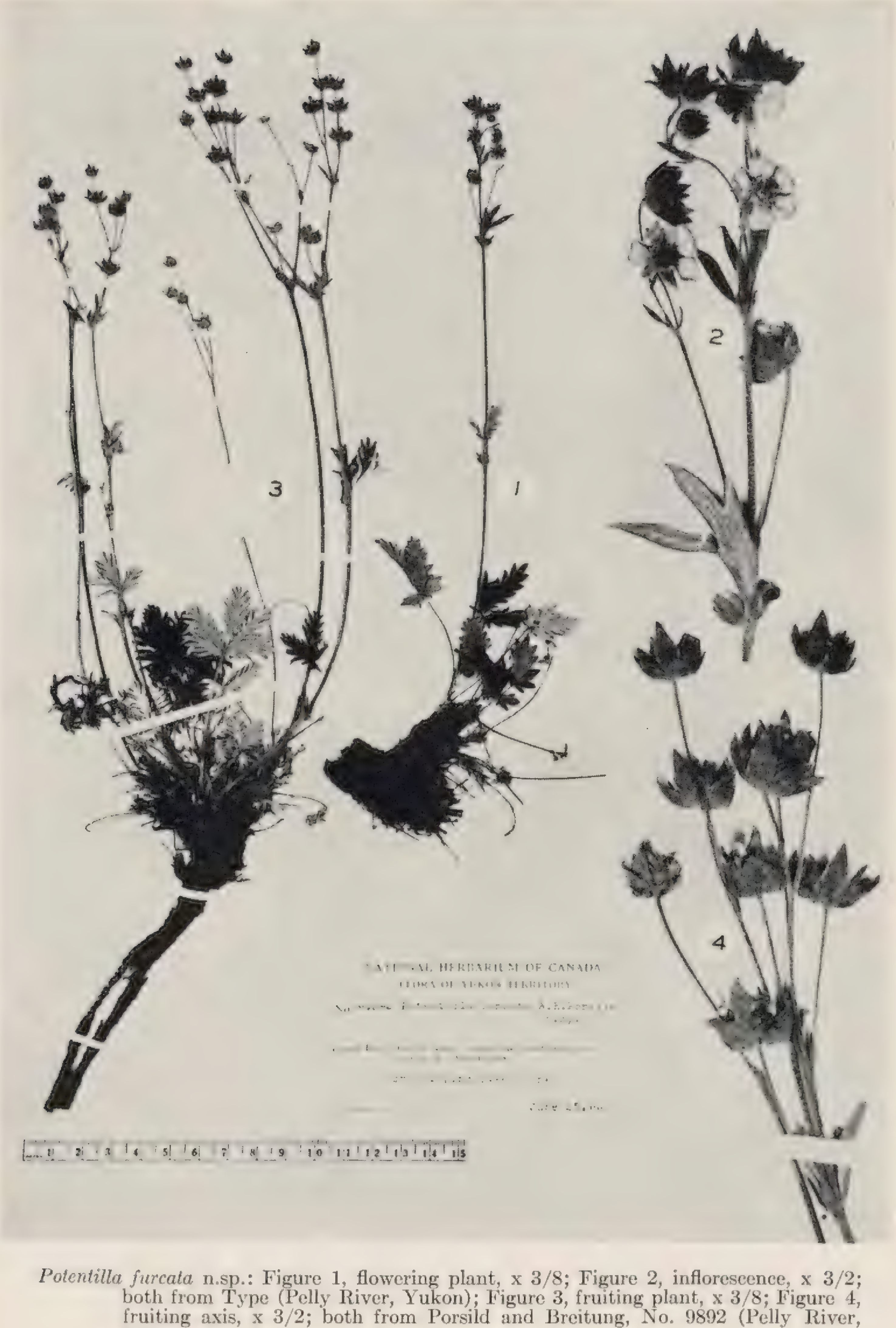
PLATE XVI



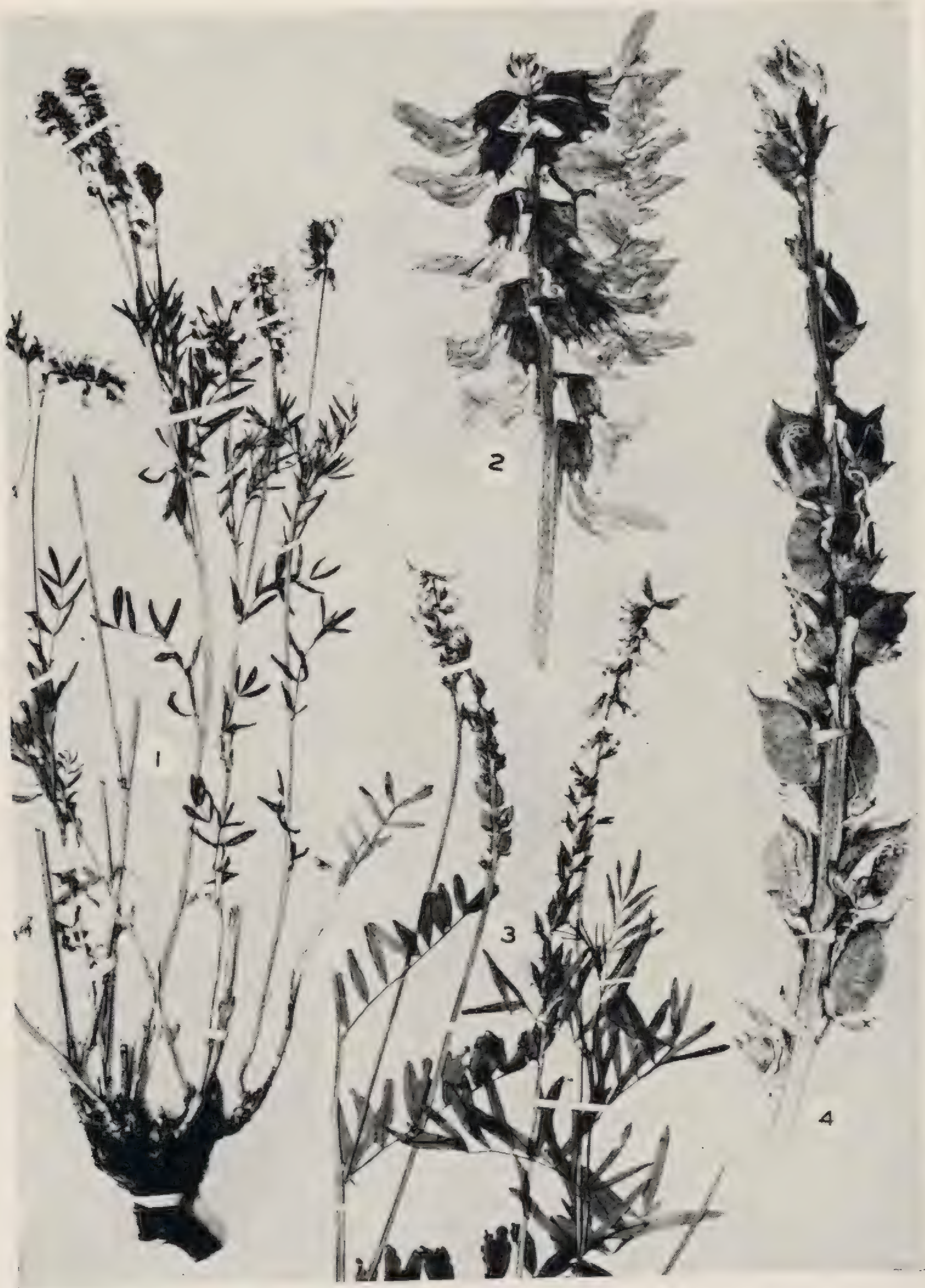
Potentilla nivea L. ssp. *Hookeriana* (Lehm.) Hitt.: Figures 1, 2, and 3, flowering and fruiting plants, x 3/8, Porsild and Breitung, No. 9854 (from Pelly Mountains, Yukon). *Papaver Keelei* Porsild: Figures 4 and 5, fruiting plants x 3/5 from Type (Mackenzie Mountains, N.W.T.); Figures 6 and 7, plants in flower and bud, x 3/8, Porsild, No. 6813 (from Richardson Mountains, west of Mackenzie Delta, N.W.T.).



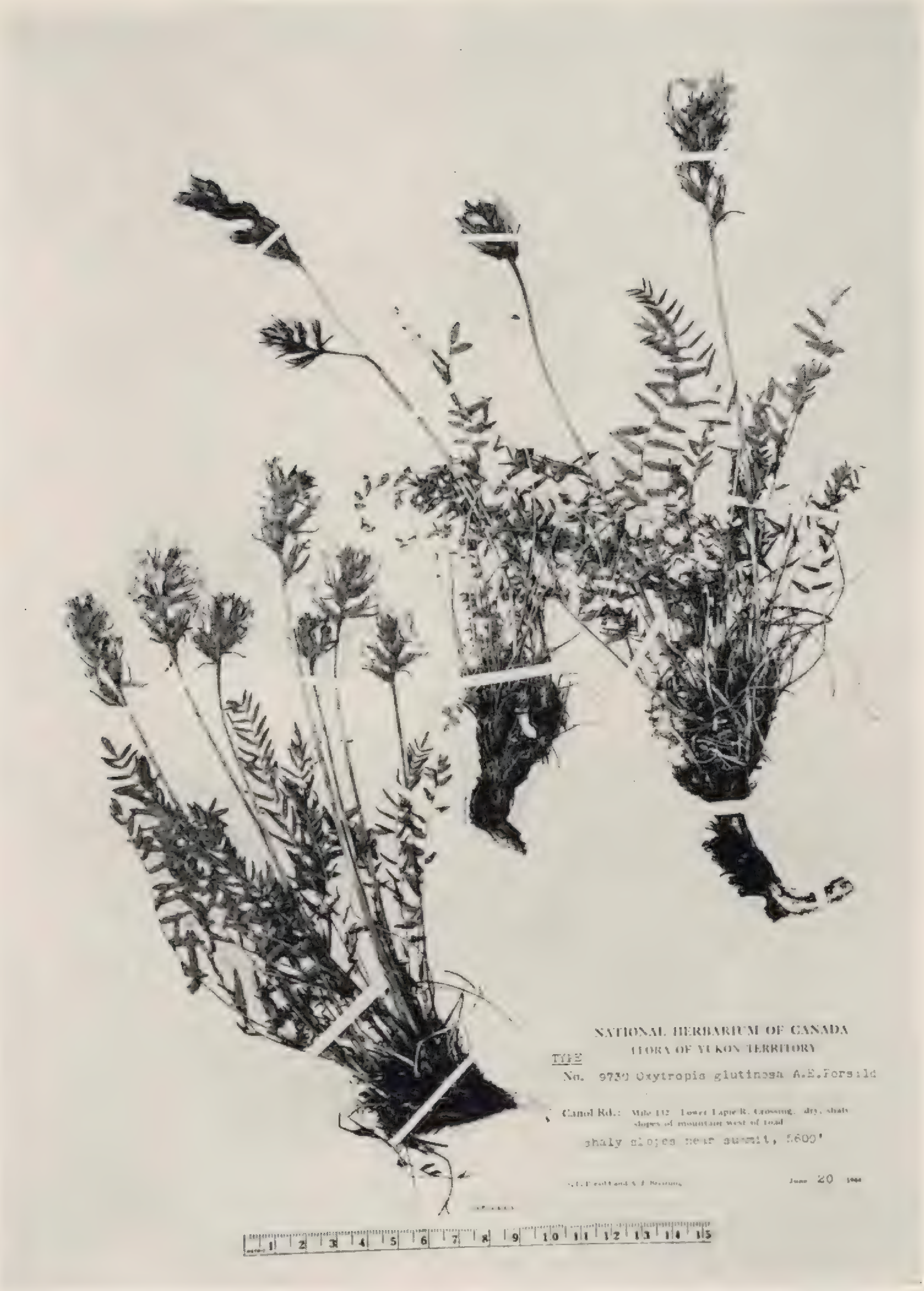
Potentilla nivea L. ssp. *fallax* n.ssp.: Figure 1, fruiting plant, x 3/2, from Type (Pelly Mountains, Yukon); Figure 2, flowering plant, x 3/2, Porsild and Breitung, No. 9443 (Pelly Mountains, Yukon). *Claytonia Bostockii* n.sp.: Figures 3 and 4, flowering plants, x 3/7, from Type (Dawson Range, Yukon). *Oxytropis Huddelsonii*, n.sp.: Figure 5, fruiting plant, x 3/7, from Type (Golden Horn Mount, south of Whitehorse, Yukon).



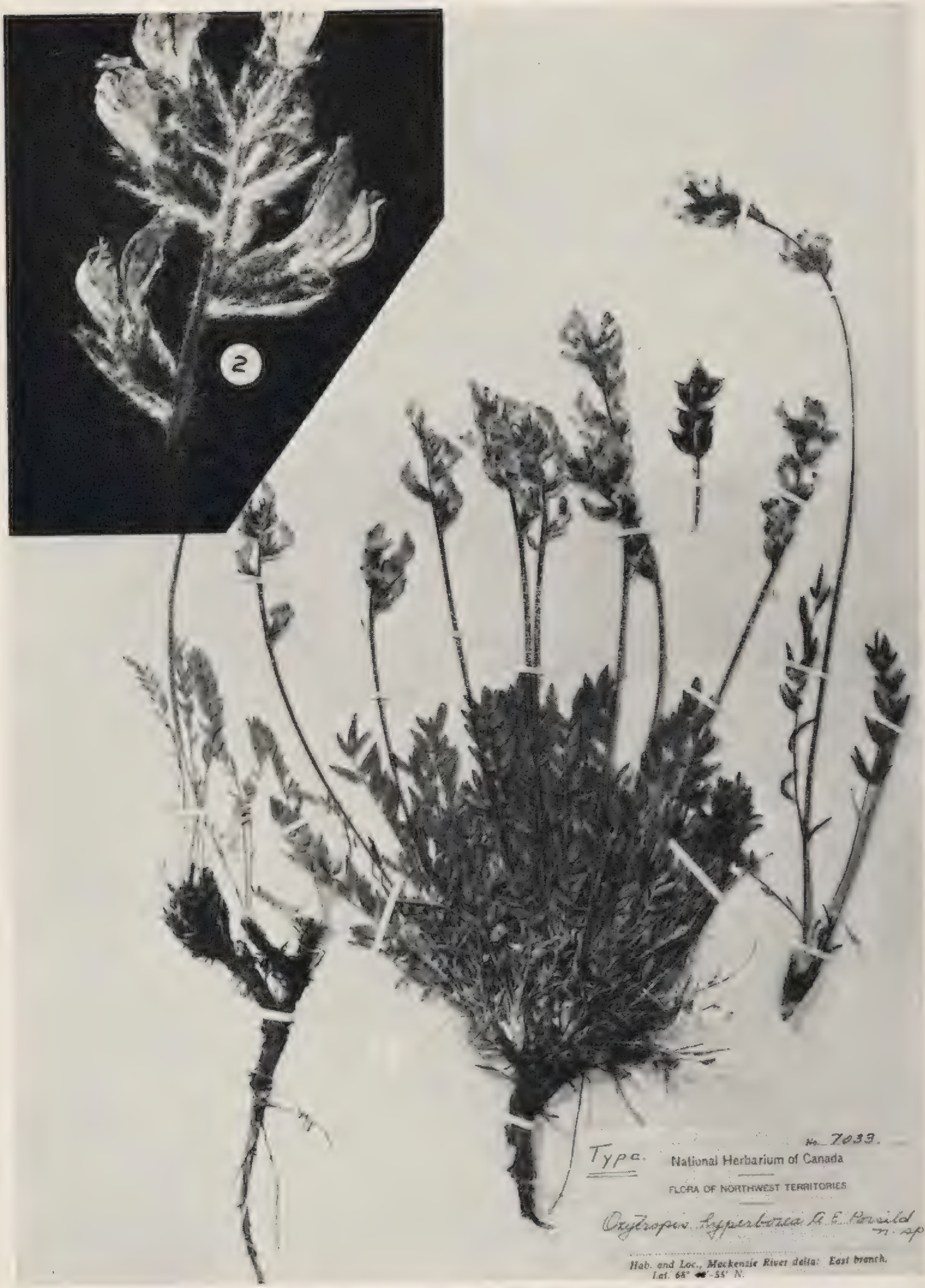
Potentilla furcata n.sp.: Figure 1, flowering plant, x 3/8; Figure 2, inflorescence, x 3/2; both from Type (Pelly River, Yukon); Figure 3, fruiting plant, x 3/8; Figure 4, fruiting axis, x 3/2; both from Porsild and Breitung, No. 9892 (Pelly River, Yukon).



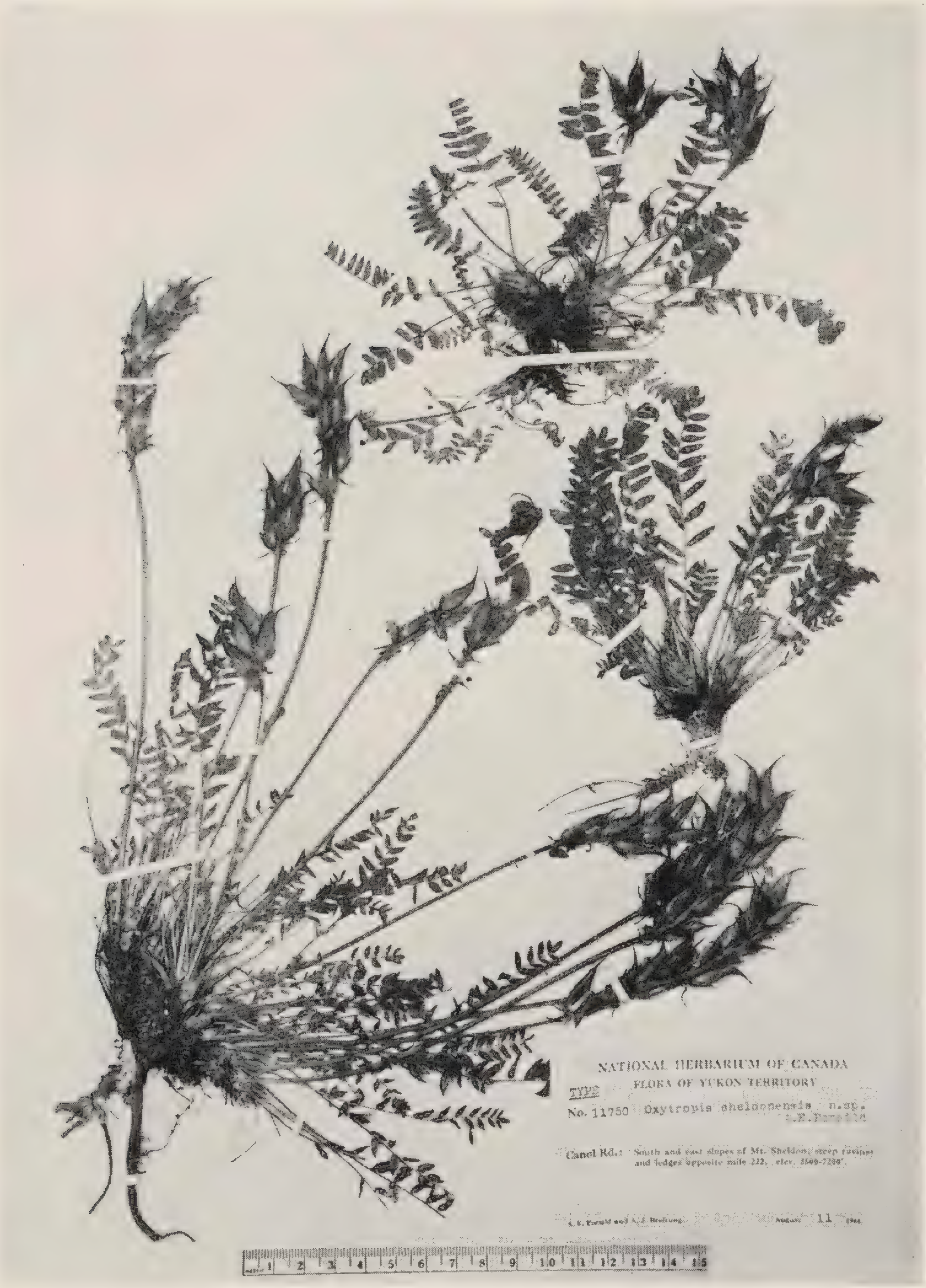
Astragalus Williamsii Rydberg: Figure 1, flowering plant, x 3/8; Figure 2, inflorescence, x 3/2; Figure 3, fruiting plants, x 3/8; Figure 4, fruiting raceme, x 3/2; all from Porsild and Breitung, Nos. 9668 and 9894 (Pelly River, Yukon).


NATIONAL HERBARIUM OF CANADA
FLORA OF YUKON TERRITORY
TYPE
No. 9730 Oxytropis glutinosa A.E.Porsild
Canol Rd.: Mile 112 Lower Lapie R. Crossing, dry, shaly slopes of mountain west of road
shaly slopes near summit, 5600'
June 20 1944
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

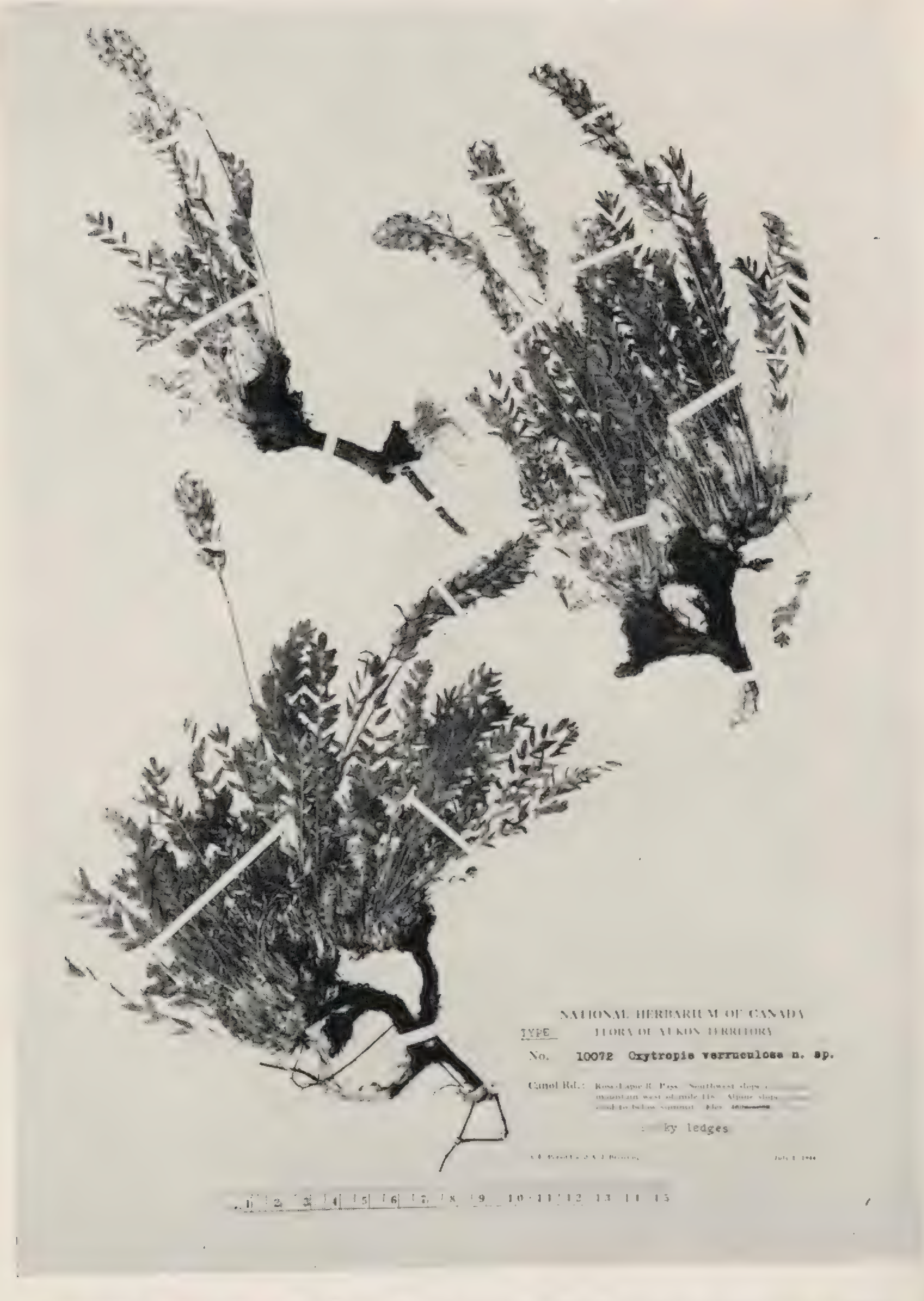
Oxytropis glutinosa n.sp.: flowering and fruiting plants, x 3/8, all from Type (Pelly Mountains, Yukon).


2
Type.
No. 7033.
National Herbarium of Canada
FLORA OF NORTHWEST TERRITORIES
Oxytropis hyperborea A. E. Porsild n. sp
Hab. and Loc., Mackenzie River delta: East branch.
Lat. 68° [illegible]'-55' N.

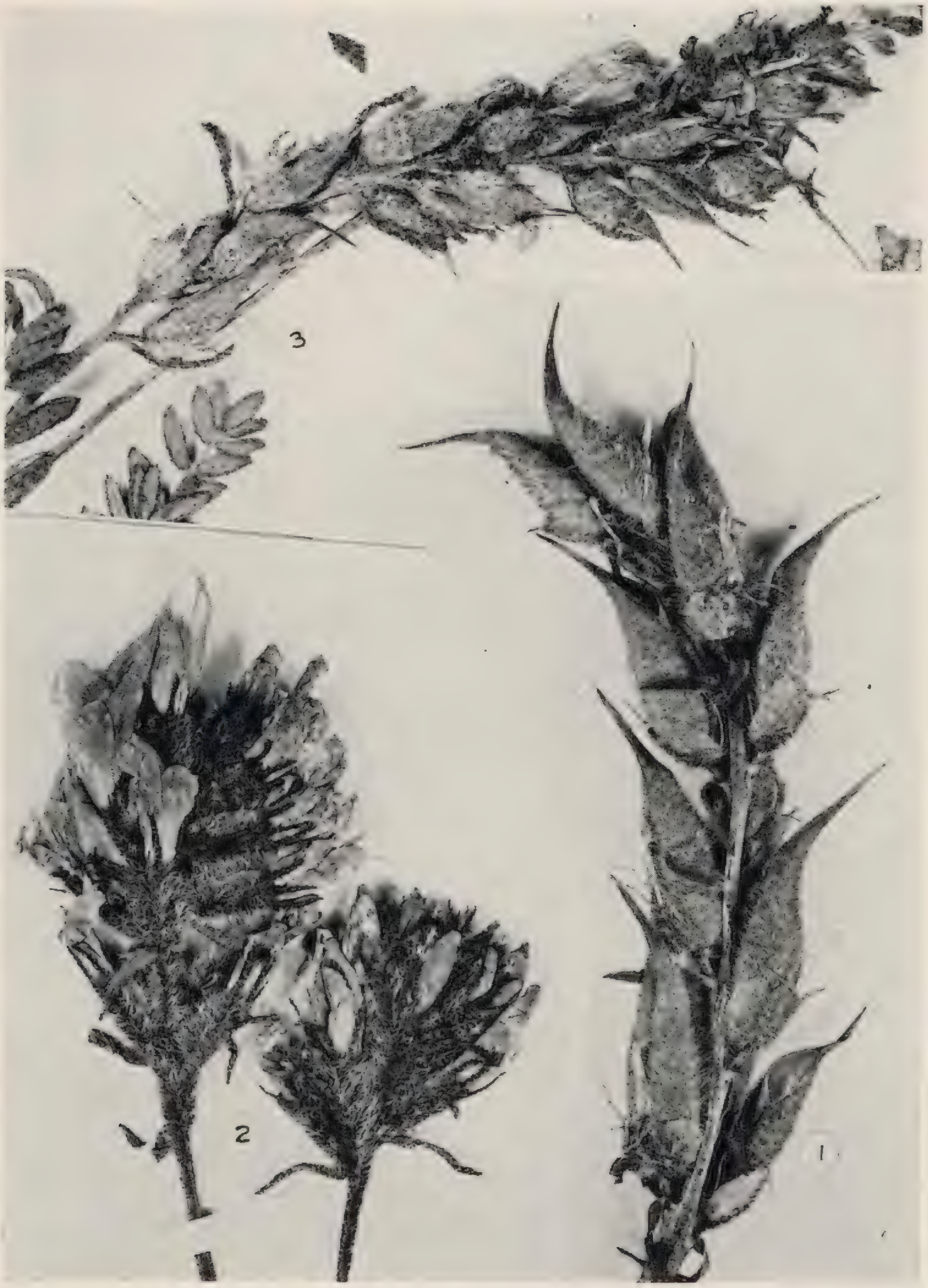
Oxytropis hyperborea Porsild: Figure 1, flowering and fruiting plants, x 3/7; Figure 2, inflorescence, x 5/4; both from Type (Mackenzie Delta, east branch, N.W.T.).


NATIONAL HERBARIUM OF CANADA
TYPE
FLORA OF YUKON TERRITORY
No. 11750 Oxytropis sheldonensis n.sp.
A.E.Porsild
Canol Rd.: South and east slopes of Mt. Sheldon; steep ravines and ledges opposite mile 222, elev. 3500-7200'.
A. E. Porsild and A. J. Breitung
August 11 1944
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

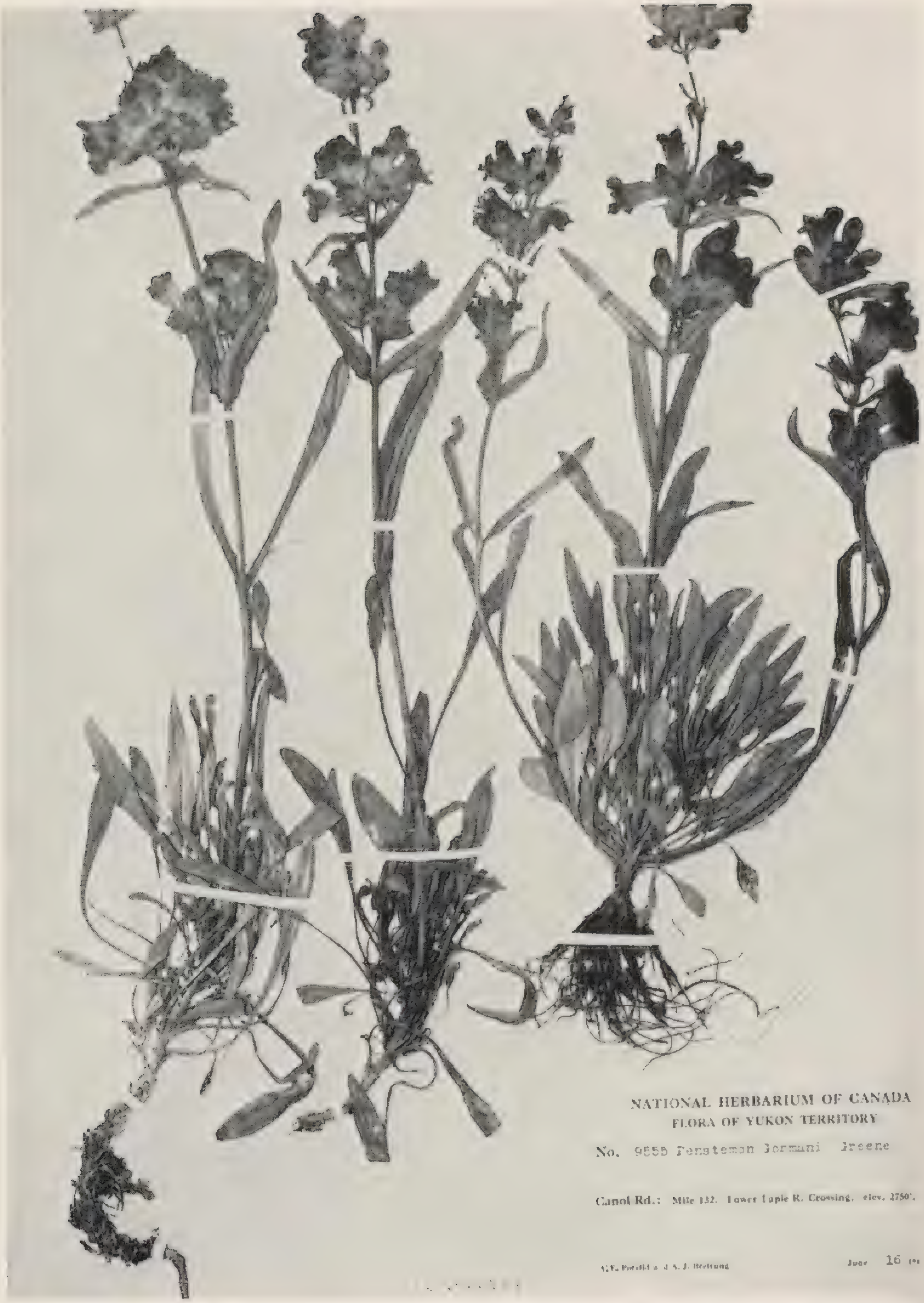
Oxytropis sheldonensis n.sp.: Fruiting plants, x 3/8, all from Type (Mount Sheldon, Yukon).



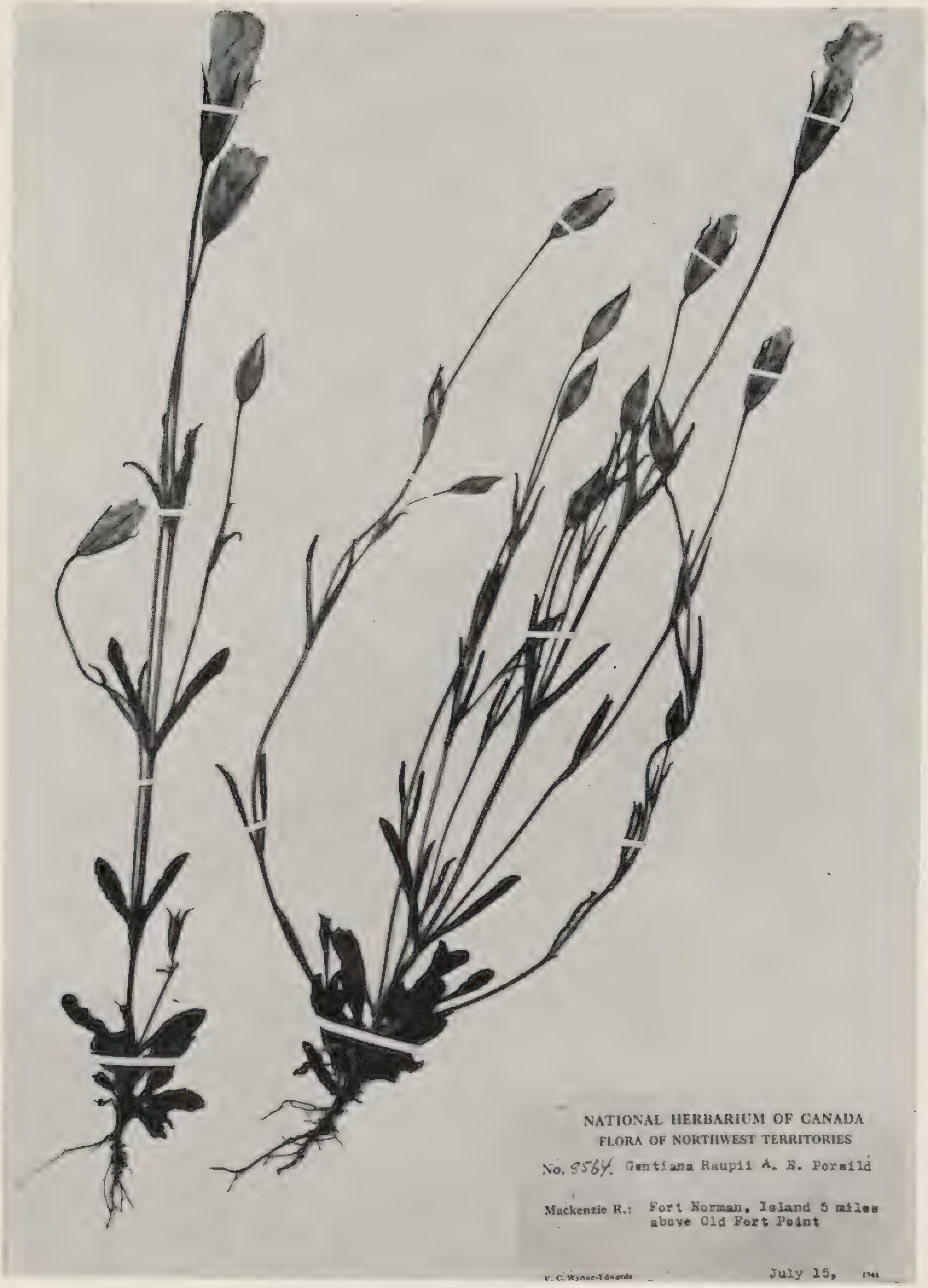
Oxytropis verruculosa n.sp.: flowering and fruiting plants, x 3/8; all from Type (Pelly Mountains, Yukon).



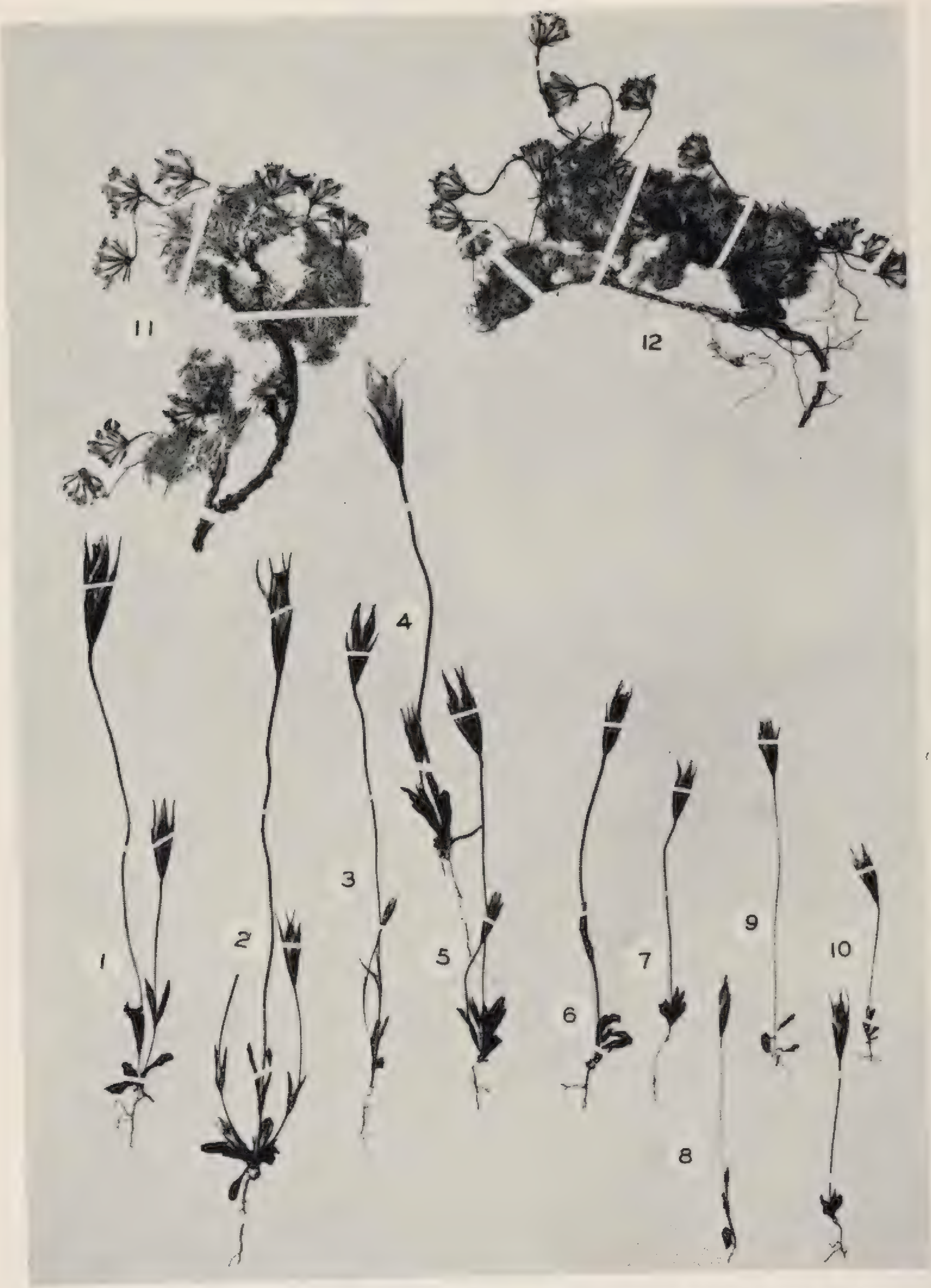
Oxytropis sheldonensis n.sp.: Figure 1, fruiting spike, x 3/2, from Type. *Oxytropis glutinosa* n.sp.: Figure 2, flowering spikes, x 3/2, from Type. *Oxytropis verruculosa* n.sp.: Figure 3, fruiting spike, x 3/2, from Type.


NATIONAL HERBARIUM OF CANADA
FLORA OF YUKON TERRITORY
No. 9555 Penstemon Gormani Greene
Canol Rd.: Mile 132. Lower Lapie R. Crossing, elev. 2750'.
A. E. Porsild and A. J. Breitung
June 16 194

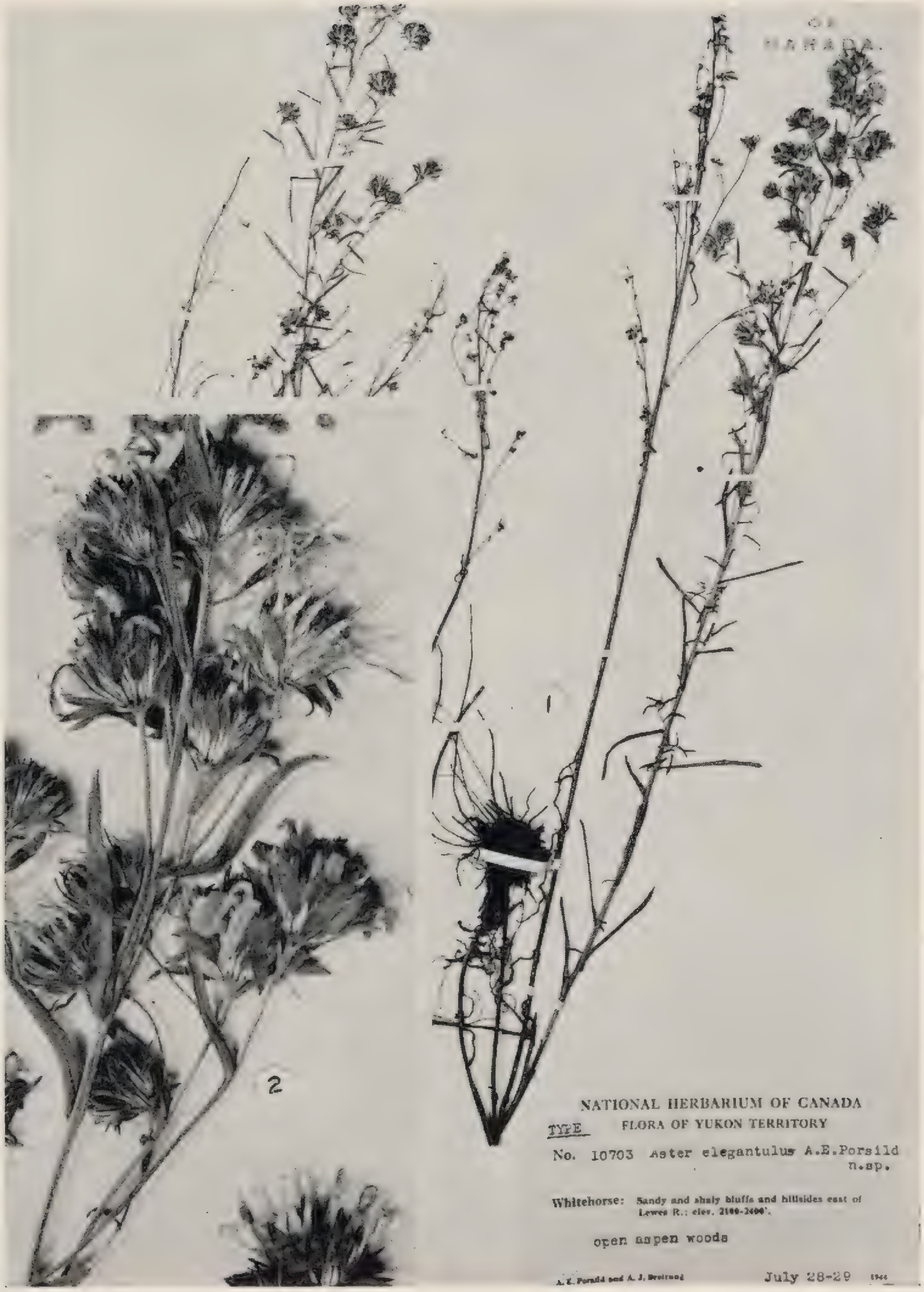
Penstemon Gormani Greene: flowering plants, x 3/7, Porsild and Breitung, No. 9555 (Pelly Mountains, Yukon).


NATIONAL HERBARIUM OF CANADA
FLORA OF NORTHWEST TERRITORIES
No. 8564. Gentiana Raupii A. E. Porsild
Mackenzie R.: Fort Norman, Island 5 miles above Old Fort Point
V. C. Wynne-Edwards
July 15, 1944

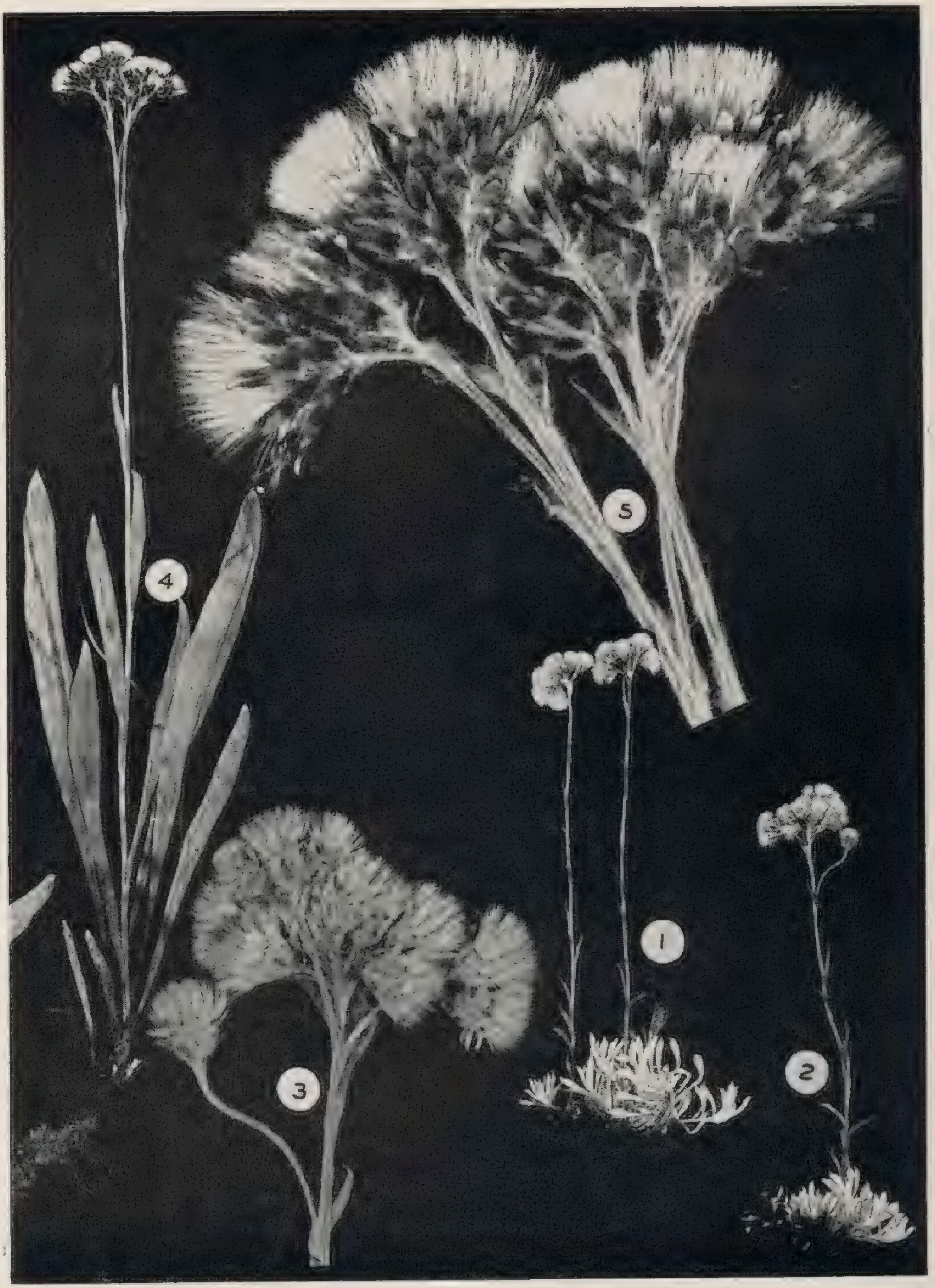
Gentiana Raupii Porsild: flowering plants. x 3/7, V. C. Wynne-Edwards, No. 8564 (Mackenzie River, N.W.T.).



Gentiana Richardsonii n.sp.: Figures 1–10, flowering and fruiting plants, x 3/7, all from Type (Arctic Coast east of Mackenzie Delta, N.W.T.). *Haplopappus MacLeani* Brandegee: Figures 11 and 12, flowering and fruiting plants, x 3/7, Porsild and Breitung, No. 9496 (Pelly Mountains, Yukon).

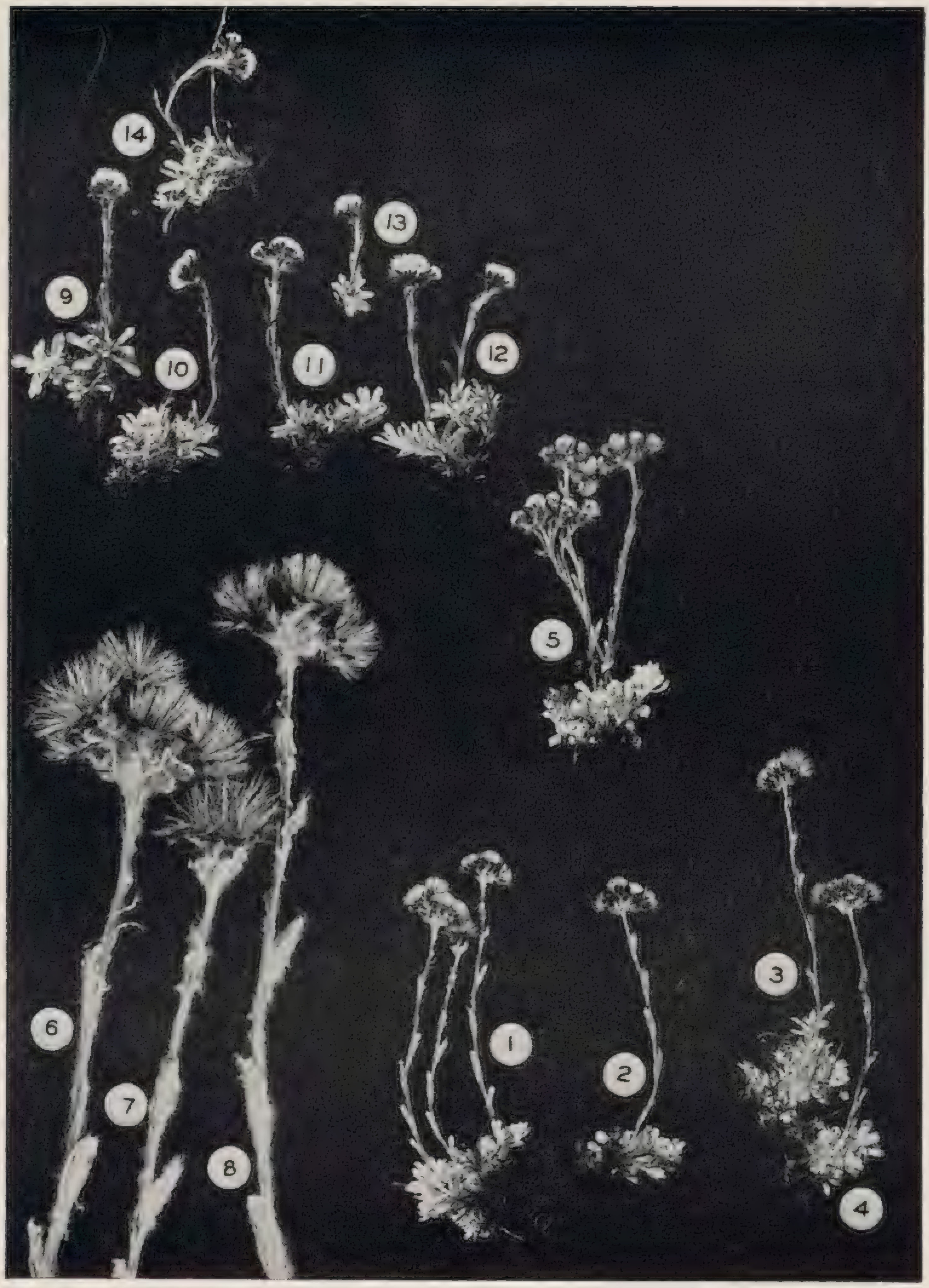

OF
CANADA
1
2
NATIONAL HERBARIUM OF CANADA
TYPE FLORA OF YUKON TERRITORY
No. 10703 Aster elegantulus A.E.Porsild n.sp.
Whitehorse: Sandy and shaly bluffs and hillsides east of Lewes R.; elev. 2100-2400'.
open aspen woods
A. E. Porsild and A. J. Breitung
July 28-29 1944

Aster elegantulus Porsild: Figure 1, flowering plant, x 1/2; Figure 2, part of flowering inflorescence, x 9/4; from Type (Whitehorse, Yukon).

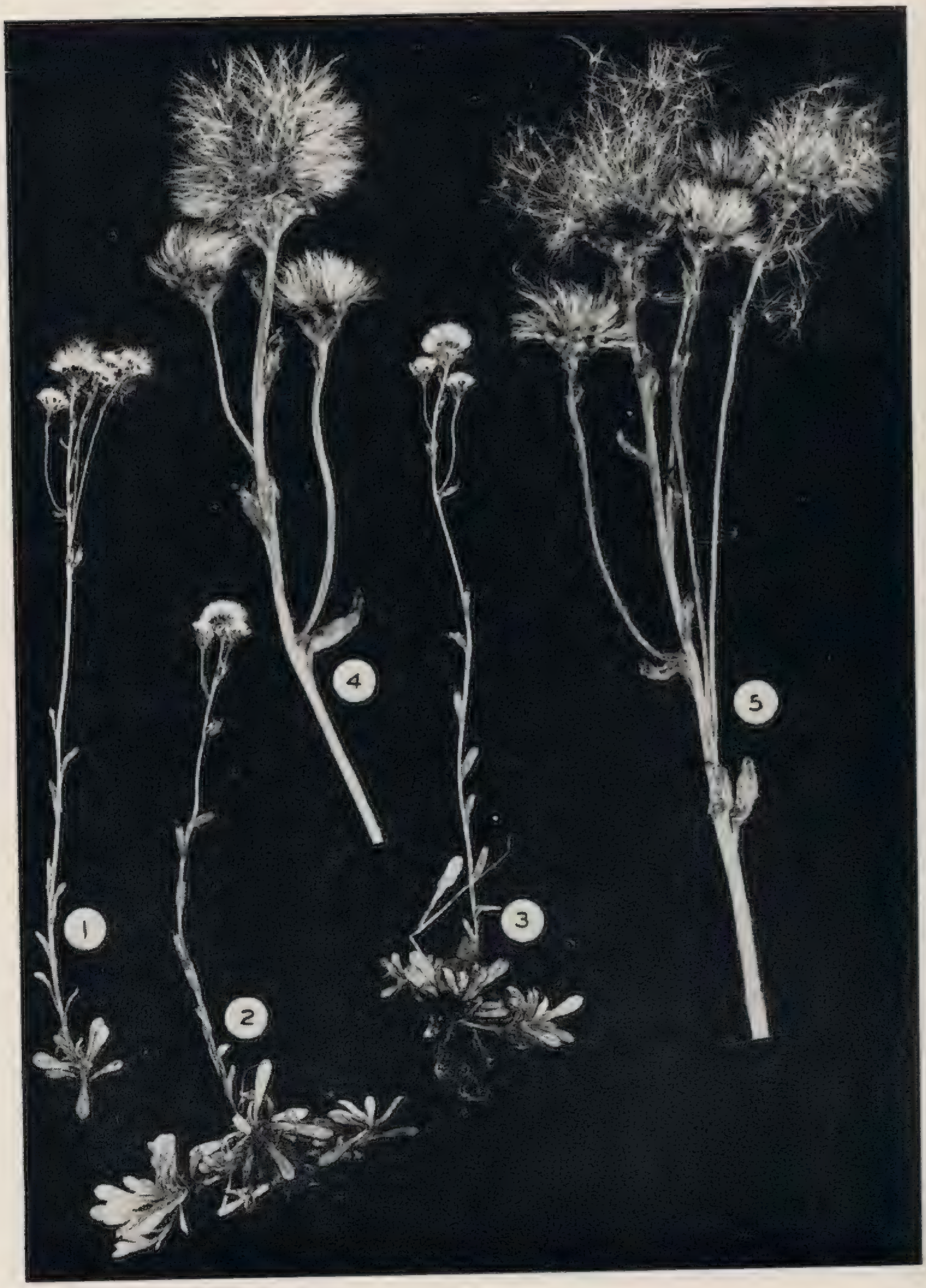


Antennaria incarnata Porsild: Figures 1 and 2, fruiting plants, x 3/7; Figure 3, fruiting head, x 3/2, all from Type (Pelly Mountains, Yukon). *Antennaria pulcherrima*, var. *angustisquama* Porsild: Figure 4, fruiting plant. x 3/7; Figure 5, fruiting heads, x 9/4; all from Type (Pelly Mountains, Yukon).

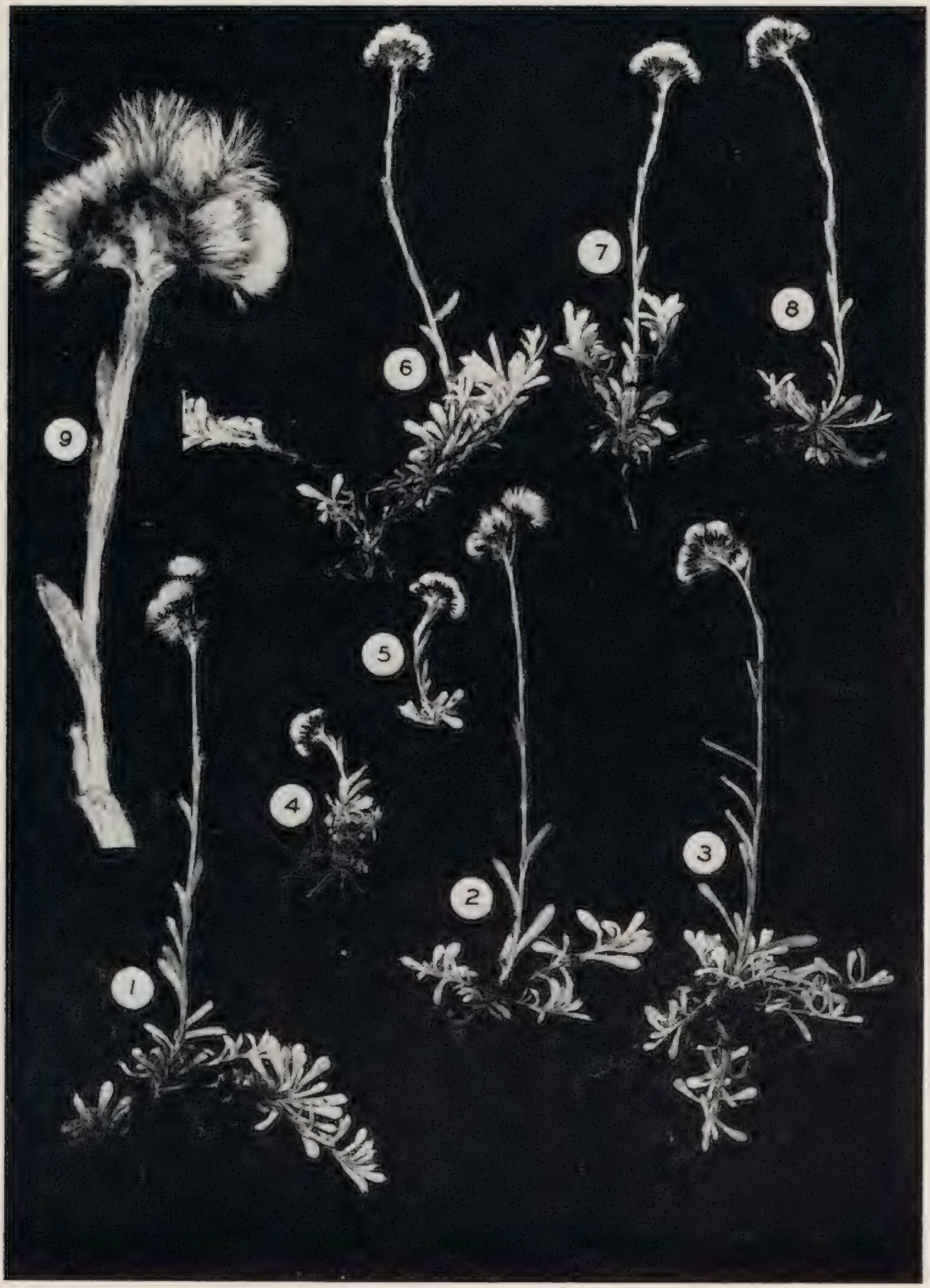
Plate XXX



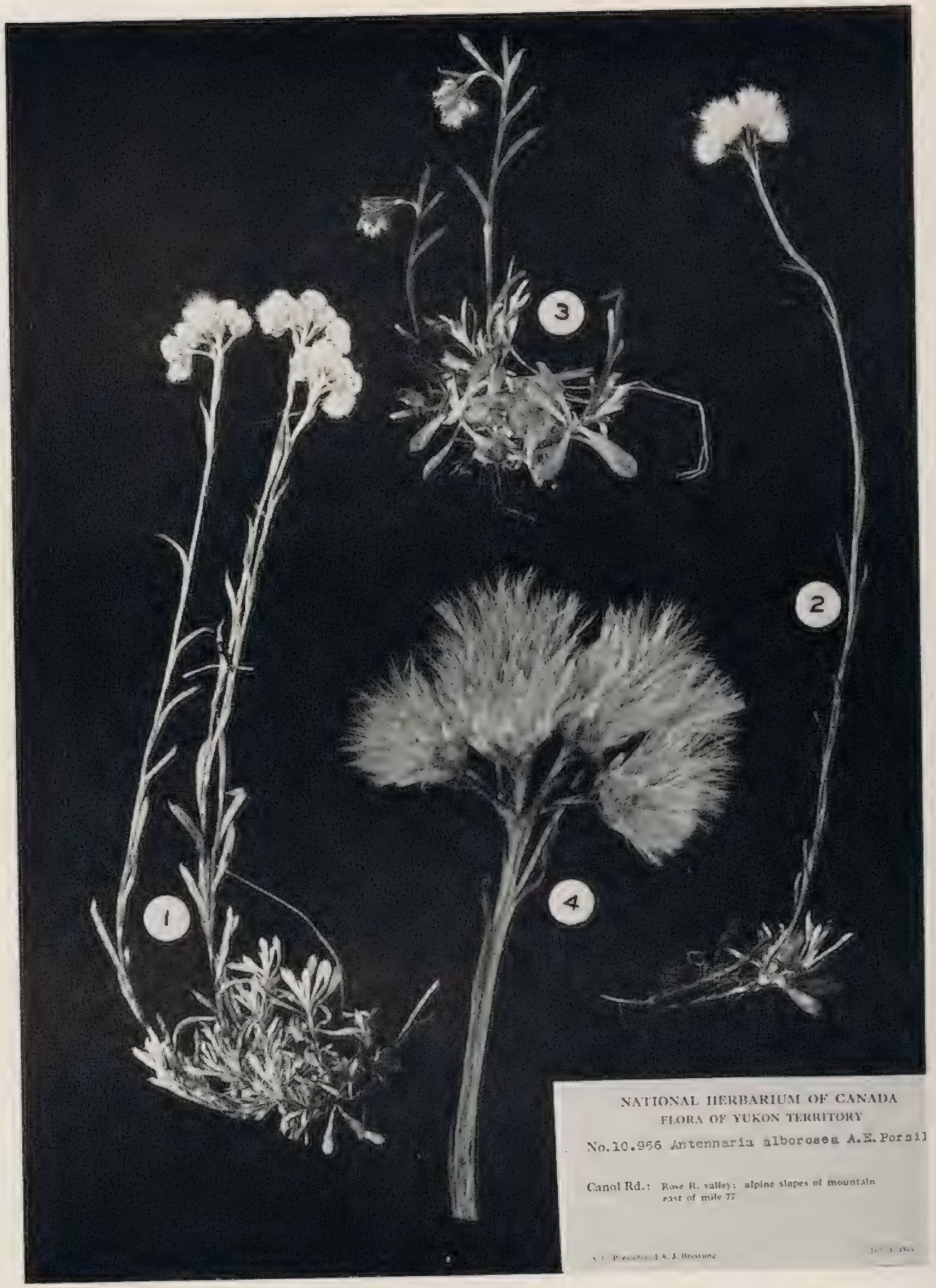
Antennaria compacta Malte: Figures 1–4, fruiting plants, x 3/7; Figures 6–8, fruiting heads, x 3/2, Porsild and Breitung, No. 11098, from Mount Sheldon, Yukon; Figure 5, fruiting plant, x 3/7, idem, No. 11012, from Pelly Mountains, Yukon. *Antennaria megacephala* Fernald: Figures 9–14, fruiting plants, x 3/7, Porsild and Breitung, No. 10091 (from Pelly Mountains, Yukon).



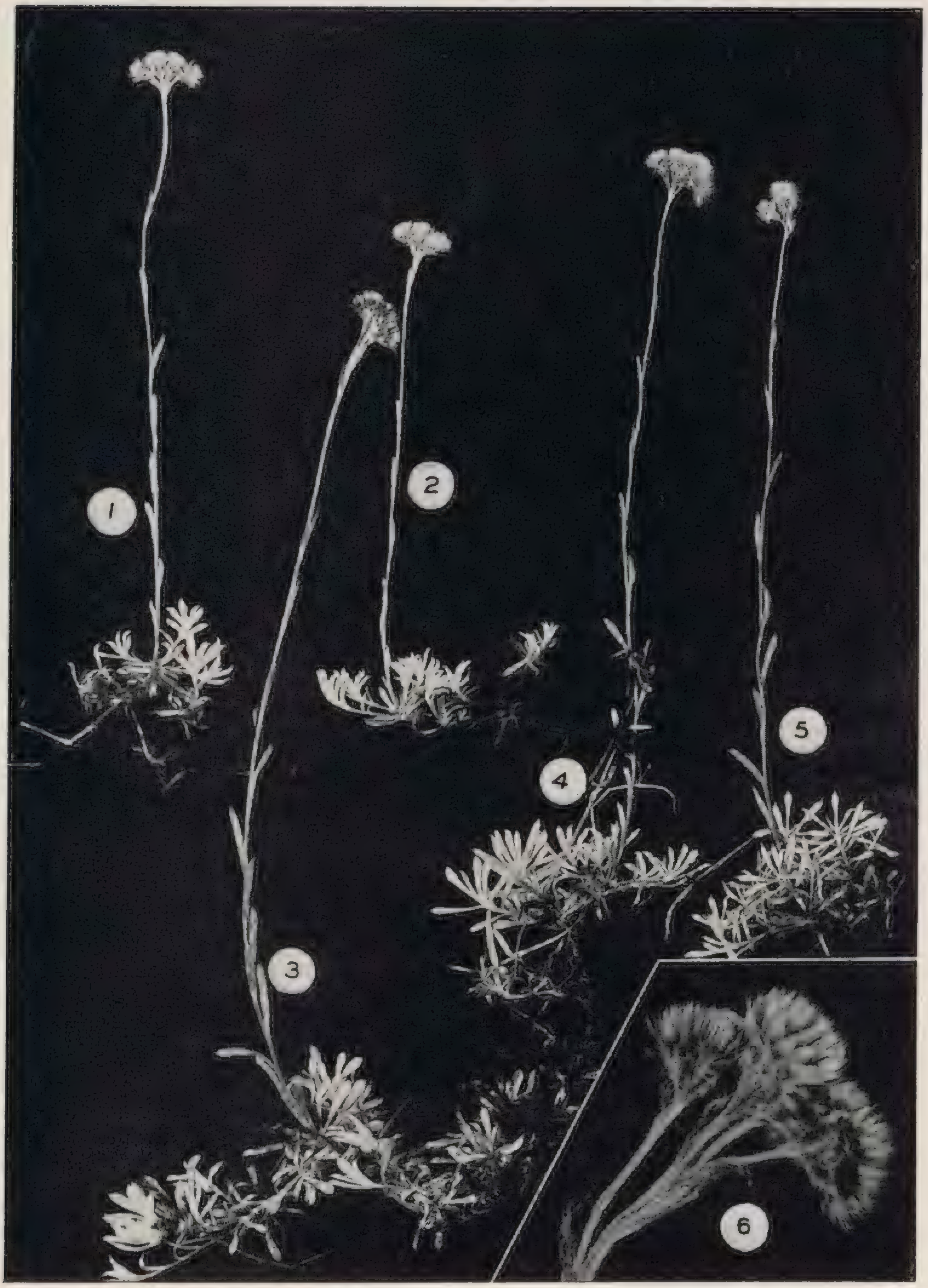
Antennaria pedunculata Porsild: Figures 1, 2 and 3, fruiting plants, x 3/7; Figure 4, fruiting head, x 3/2, all from Type (Pelly Mountains, Yukon); Figure 5, fruiting head, x 3/2, Porsild and Breitung, No. 10965 (Pelly Mountains, Yukon).



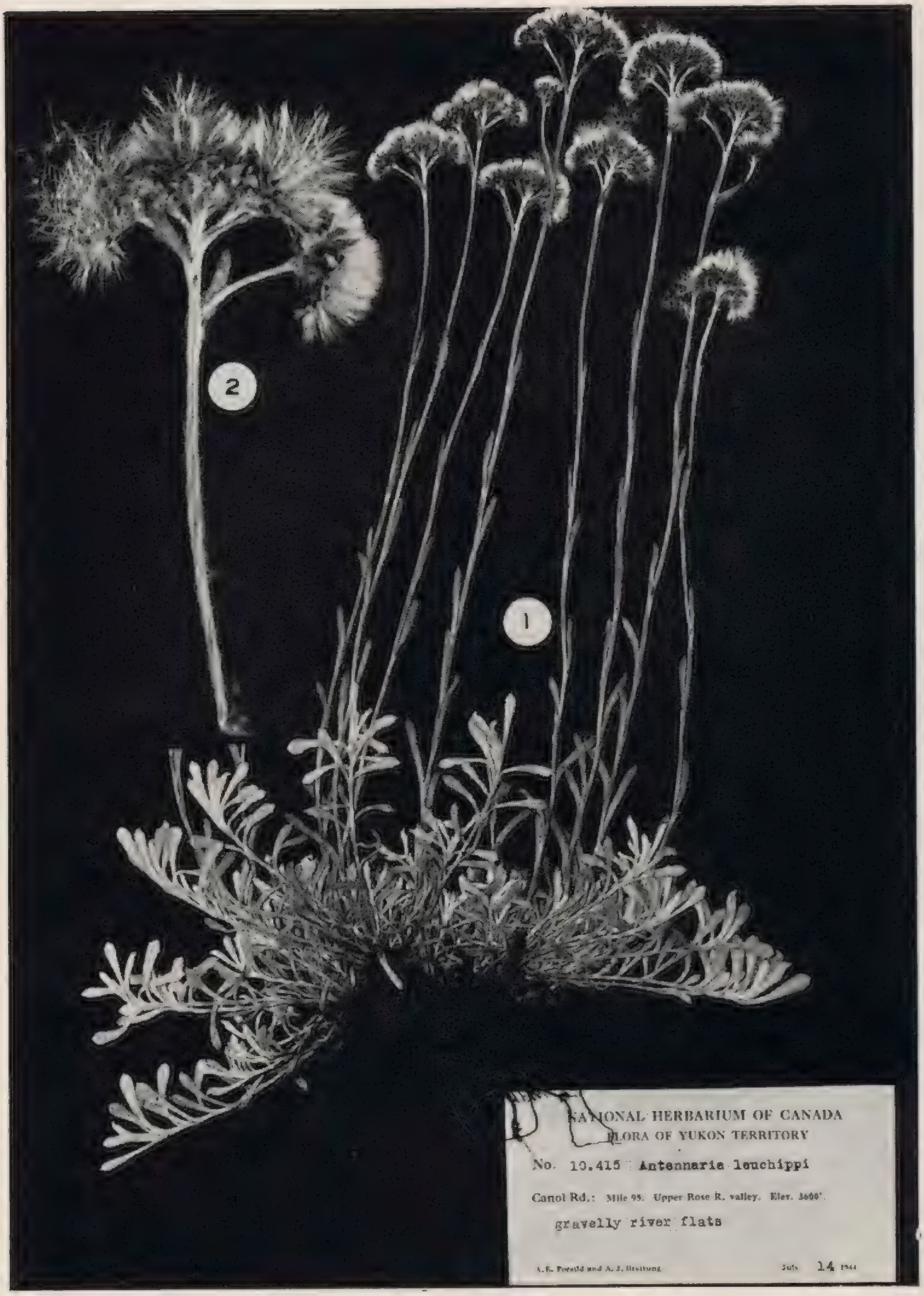
Antennaria stolonifera Porsild: Figures 1-8, fruiting plants x 3/7; Figure 9, fruiting head, x 3/2; all from Type (Macmillan River, Yukon).


3
2
1
4
NATIONAL HERBARIUM OF CANADA
FLORA OF YUKON TERRITORY
No.10.956 Antennaria alborosea A.E.Porsil
Canol Rd.: Rose R. valley; alpine slopes of mountain
east of mile 77

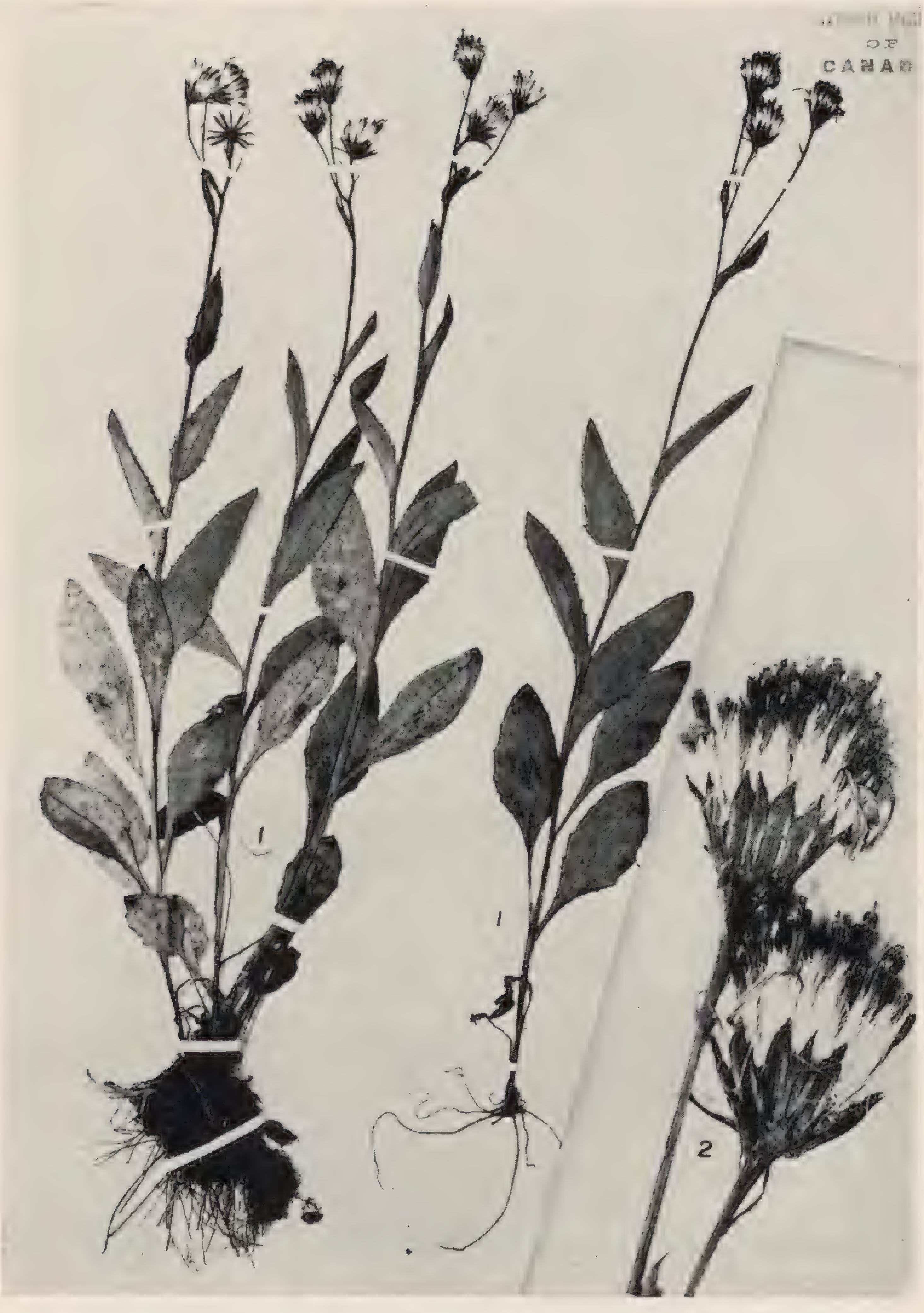
Antennaria alborosea Porsild: Figures 1 and 2, fruiting plants, x 3/7; Figure 4, fruiting head, x 3/2, all from Porsild and Breitung, No. 10966; Figure 3, flowering plant, x 3/7, Porsild and Breitung, No. 9326 (all from Pelly Mts., Yukon).



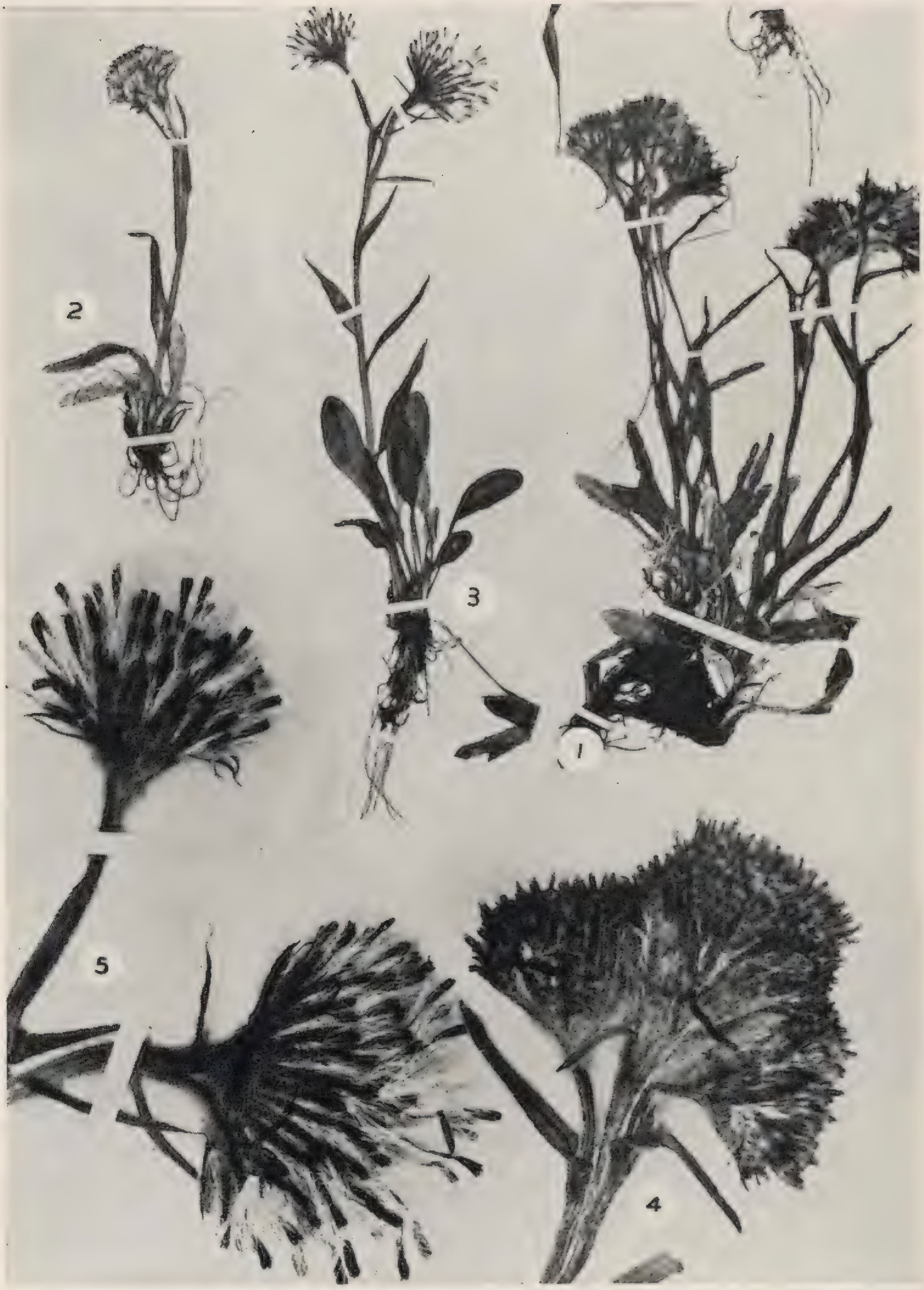
Antennaria elegans Porsild; Figures 1 and 2, flowering plants, x 3/7, both from Type (Pelly Mountains, Yukon); Figure 3, fruiting plant, x 3/7, Porsild and Breitung, No. 10414 (Pelly Mountains); Figures 4 and 5, fruiting plants, x 3/7; Figure 6, fruiting head, x 3/2, all Porsild and Breitung, No. 11639 (Mount Sheldon, Yukon).


2
1
NATIONAL HERBARIUM OF CANADA
FLORA OF YUKON TERRITORY
No. 10.415 Antennaria leuchippi
Canol Rd.: Mile 95. Upper Rose R. valley. Elev. 3600'.
gravelly river flats
A. E. Porsild and A. J. Breitung
July 14 1944

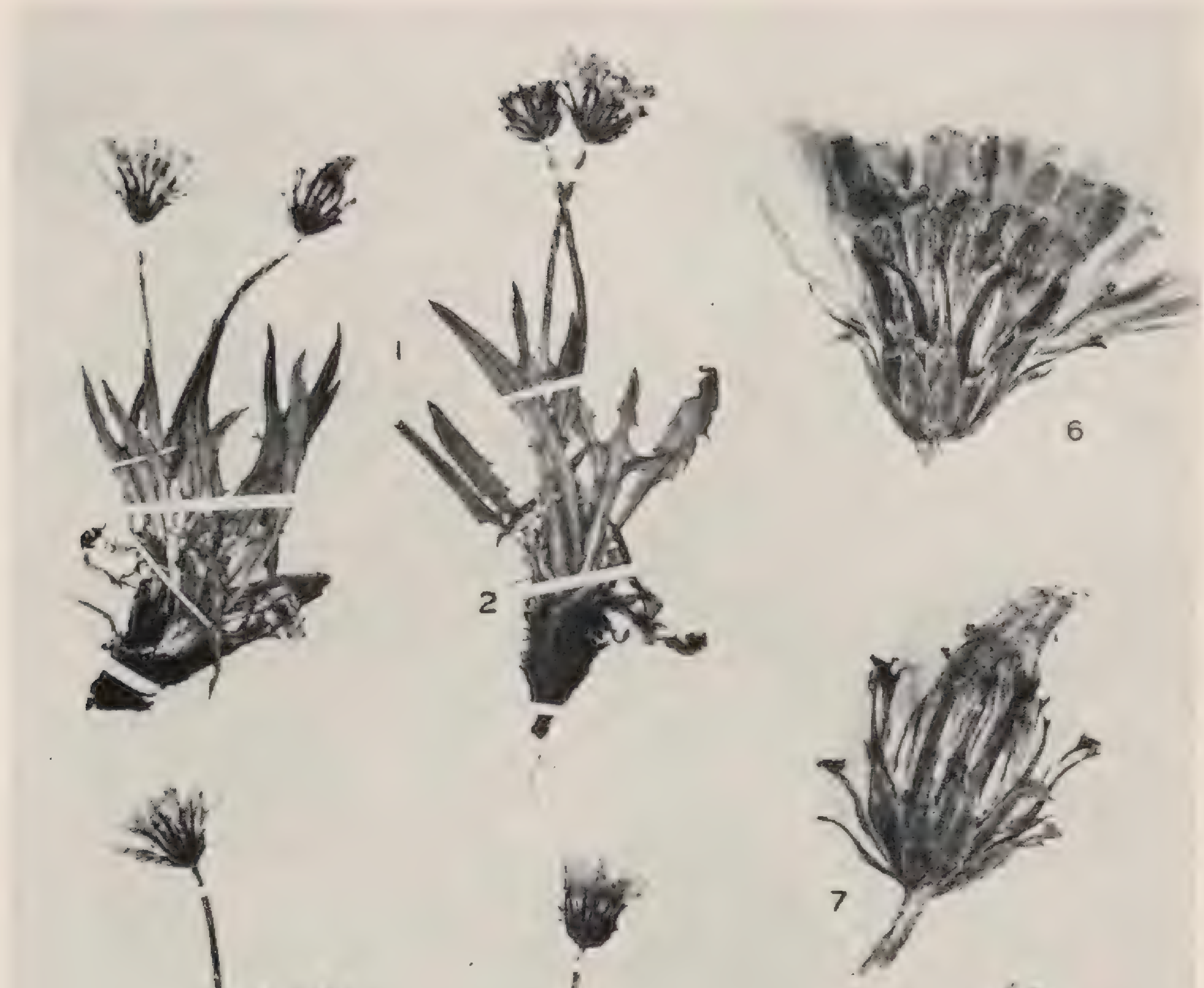
Antennaria leuchippi M. P. Porsild: Figure 1, fruiting plant, x 3/7; Figure 2, fruiting head, x 3/2, Porsild and Breitung, No. 10415 (Pelly Mountains, Yukon).



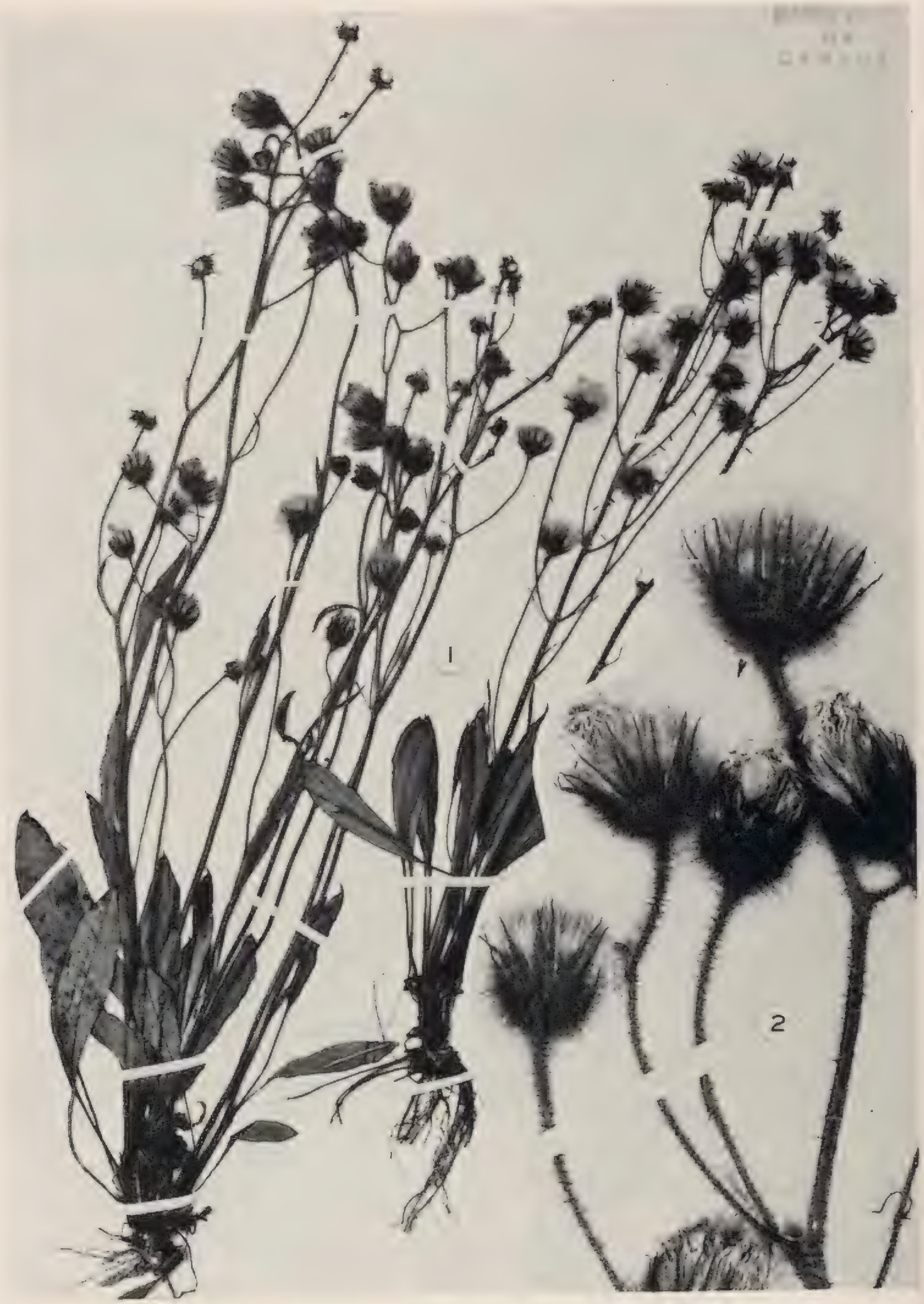
Senecio sheldonensis Porsild: Figure 1, fruiting plants x 3/7; Figure 2, fruiting heads, x 9/4; both from Type (Mount Sheldon, Yukon).



Senecio yukonensis Porsild: Figures 1 and 2, flowering plants, x 3/7; Figure 4, flowering head, x 3/2, all from Type (Pelly Mountains, Yukon); Figure 3, fruiting plant, x 3/7; Figure 5, fruiting heads, x 3/2; Porsild and Breitung, No. 11096 (Mount Sheldon, Yukon).



Taraxacum pellianum Porsild: Figures 1–5, flowering and fruiting plants, x 3/7; Figure 6, flowering head, x 3/2; Figure 7, fruiting head, x 3/2; all from Type (Pelly Mountains, Yukon).



Hieracium gracile Hook. var. *yukonense* Porsild: Figure 1, fruiting plants, x 3/7; Figure 2, part of fruiting infloresecence, x 3/2, all from Type (Mount Sheldon), Yukon).

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Italic type is used to indicate synonyms, as well as names of plants not present in the Yukon Flora, or such as are mentioned only incidentally in the catalogue.

Bold-face numerals indicate page on which principal discussion of species is given. Names printed in boldface indicate new species, new names, and new combinations.

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